FRITZ!Box Fon WLAN 7570 vDSL

Installation, configuration and operation

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FRITZ!Box Fon WLAN 7570 vDSL

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I CONNECTING AND OPERATION

1 Security and Handling
What to watch out for

Security

When working with the FRITZ!Box Fon WLAN 7570 vDSL, observe the following security instructions in order to protect yourself and the FRITZ!Box from harm.

- Do **not** install the FRITZ!Box during an electrical storm.
- Disconnect FRITZ!Box from the power supply during electrical storms.
- Never let liquids get inside the FRITZ!Box. Otherwise, electric shocks or short circuits may result.
- The FRITZ!Box is intended for indoor use only.
- Do not open the FRITZ!Box housing. The device contains hazardous components and should only be opened by authorized repair technicians.

Handling

You can either place FRITZ!Box on a horizontal surface or mount it on a wall. Please note the following:

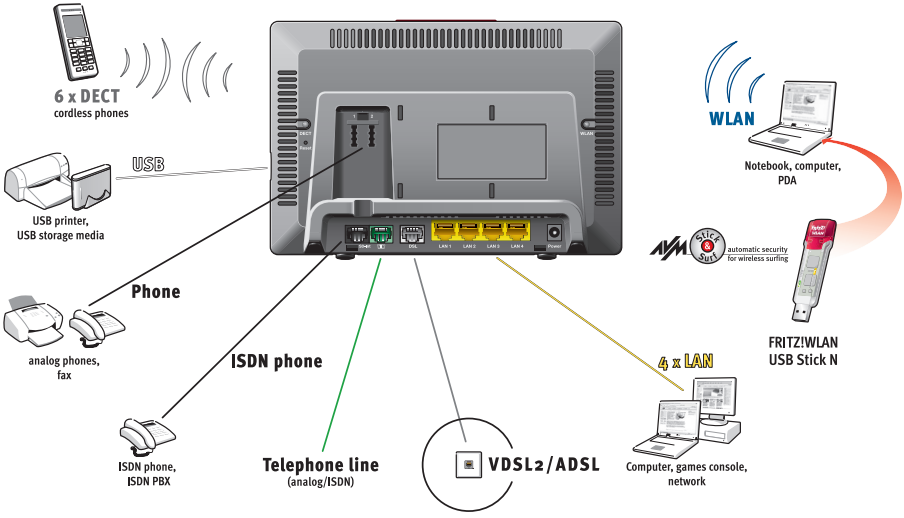
- Place or hang the FRITZ!Box in a dry location that is free of dust and protected from direct sunlight.
- Do not place FRITZ!Box on excessively heat-sensitive surfaces, as the base of the device can heat up during normal operation.
- When connecting to your FRITZ!Box computer using the network, remember to take the length of the cable into account.
- If you would like to establish wireless connections between FRITZ!Box and the computer, position the device at a central location.
- Make sure to keep sufficient distance from potential sources of interference like microwave devices or electric devices with large metal housings.

For detailed information about the symbols, numerals and function keys used in the manual, see the section “Directions for Operation” from page 115.

2 FRITZ!Box Fon WLAN 7570 vDSL
An Overview

The FRITZ!Box Fon WLAN 7570 vDSL is a Private Branch Exchange (PBX) for making telephone calls via the Internet and the fixed-line network.

The FRITZ!Box connects your computers directly with your DSL line. Each connected computer can establish an Internet connection over the FRITZ!Box. As a WLAN access point, FRITZ!Box offers you the possibility of connecting your computer to the DSL or VDSL line wirelessly.



Possibilities for connecting FRITZ!Box

PBX

FRITZ!Box is a PBX for the connection of analog and ISDN terminal devices. You can connect two analog telephones to FRITZ!Box. Up to eight ISDN telephony devices can be connected to the integrated ISDN S_0 port. You can make telephone calls using the Internet, ISDN, or the analog fixed-line network using all of the connected telephones.

Using Cordless Phones

Thanks to the DECT function, the FRITZ!Box can be used as a basis station for cordless phones. Every cordless phone that supports the DECT-GAP standard can be registered at the FRITZ!Box.

Connecting Computers

Four computers can be connected directly to the FRITZ!Box using the four LAN ports.

You can also connect a network hub or switch to the LAN ports so that even more computers can be connected to FRITZ!Box.

WLAN Access Point

The FRITZ!Box is a WLAN access point. All computers equipped with a WLAN adapter can be wirelessly connected to the FRITZ!Box.

Local Network

All of the computers connected with the FRITZ!Box constitute a network and can share access to any files released for file sharing.

Internet

All of the computers connected to the FRITZ!Box can access the Internet.

The FRITZ!Box works as a DSL router, making the Internet connection available to all connected computers. All connected computers can then use the Internet connection at the same time.

Firewall

The FRITZ!Box is equipped with an integrated firewall. When the FRITZ!Box Fon WLAN 7570 vDSL is operated as a router, this firewall protects your network from attacks from the Internet.

USB Port

The FRITZ!Box is equipped with a USB host controller to which you can connect a USB storage device (hard drive, stick), a printer, an AVM FRITZ!WLAN USB Stick N, an AVM FRITZ!WLAN USB Stick or a USB hub.

The USB port supports the USB 1.1 and USB 2.0 standards.

If you use AVM's FRITZ!WLAN USB Stick N or the FRITZ!WLAN USB Stick, AVM Stick & Surf technology is at your disposal. Use Stick & Surf to adopt the WLAN security settings from the FRITZ!Box quickly and conveniently.

For connecting a printer, FRITZ!Box has a printer server.

Media Server

An integrated media server makes music files available in the local network. Music files from a USB stick can be made available even when the computer is switched off.

Network Devices

Other network devices can also be connected to the network ports of the FRITZ!Box, for instance game consoles.

Operating Systems Supported

The FRITZ!Box can be connected to computers with Windows operating systems, the Linux operating system or Apple computers with the Mac OS X operating system.

2.1 Package Contents

The following is included in the FRITZ!Box Fon WLAN 7570 vDSL package:

- FRITZ!Box Fon WLAN 7570 vDSL
- one power supply unit with a cable for connection to the power mains
- one DS cable (gray) for connection to a DSL/VDSL and
- one telephone cable (green) for connection to a telephone line (ISDN or analog)
- one network cable (yellow) for connection to a computer or a network
- one RJ45/RJ11 adapter (gray) for the DSL or VDSL line (required in some countries)
- one RJ45/RJ11 adapter (black) for connecting FRITZ!Box Fon WLAN 7570 vDSL to the analog telephone network
- two TAE/RJ11 adapters for connecting analog terminal equipment (telephone, answering machine, fax)
- one FRITZ!Box CD with
  - Installation Help
  - FRITZ!DSL software package
  - software for the printer port
  - documentation for all enclosed AVM products
- printed installation manual
- one wall holder for fastening the FRITZ!Box Fon WLAN 7570 vDSL on the wall

2.2 Operation Requirements

In order to operate the FRITZ!Box, you must have the following:

- a Web browser that supports Java script (for instance, Internet Explorer version 6.0 or higher, or Firefox version 1.5 or higher)
- DSL line 1TR112 (compatible with U-R2), ITU G.992.1, ITU G.992.3, ITU G.992.5, **or** a VDSL line
- for connection via WLAN:

  computer with a WLAN adapter compliant with IEEE 802.11n draft 2.0, IEEE 802.11g, IEEE 802.11a or IEEE 802.11b, for example a FRITZ!WLAN USB Stick N
- for connection via network cable:

  computer with a network port (network adapter standard Ethernet 10/100 Base-T)
- for fixed-line telephony:

  an ISDN point-to-multipoint line in accordance with the Euro ISDN protocol DSS1, **or** an analog telephone line
- to install the DSL software FRITZ!DSL, the minimum computer requirements are:
  - Pentium III processor (or comparable) with Windows Vista (32-bit) or Windows XP (32-bit) and CD drive
  - 128 MB RAM
  - 40 MB free memory on the hard drive

3 Connecting
Connecting FRITZ!Box

This chapter contains instructions on the following topics:

- launching FRITZ!Box operation
- connecting FRITZ!Box to electrical power
- connecting one or several computers to the FRITZ!Box
- connecting FRITZ!Box to DSLDSL/VDSL
- connecting FRITZ!Box to ISDN or the analog telephone line
- connecting ISDN terminal devices to the FRITZ!Box
- connecting analog terminal devices to the FRITZ!Box

Please see the instructions about the placement of the FRITZ!Box in section “Security and Handling” on page 7.

3.1 Launching Operation

We recommend using the Installation Help on the FRITZ!Box CD when launching operation of the FRITZ!Box for the first time.

Using the Installation Help on the CD

On computers with Windows operating systems you can use the Installation Help on the FRITZ!Box CD. The Installation Help presents instructions on the screen, guiding you through the steps required to launch operation of the FRITZ!Box.

1. Insert the FRITZ!Box CD in the CD-ROM drive of your computer.

   The Installation Help starts automatically.

2. Follow the instructions in the Installation Help to prepare the FRITZ!Box for operation.

At the conclusion of the Installation Help, you will be routed directly to the FRITZ!Box user interface.

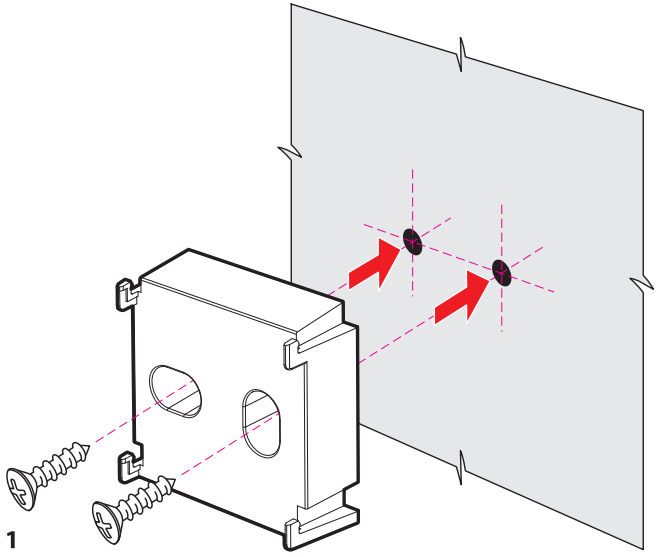
Launching Operation without the Installation Help CD

If you do not want to use the Installation Help on the FRITZ!Box CD, then work through the instructions below in the recommended order:

1. Placement of FRITZ!Box; see the section “Security and Handling” from page 7.
2. Connect FRITZ!Box to the power supply; see the section “Connecting to Electrical Power” on page 16.
3. Connect FRITZ!Box to the computer(s); see the section “Connecting the Computer(s)” on page 17.
4. Connect FRITZ!Box to DSL/VDSL; see “Connecting to the DSL/VDSL Line” from page 23.
5. If you want to make telephone calls with the fixed-line network using FRITZ!Box:
   - If you have an ISDN line, please read the section “Connecting to the ISDN Line” on page 24.
   - If you have an analog line, please read the section “Connecting with the Analog Telephone Line” on page 25.
6. If you want to make telephone calls using the Internet and/or the fixed-line network, connect your analog equipment to the FRITZ!Box; see the section “Connecting Telephone, Fax, or Answering Machine” on page 26.
7. If you want to connect an ISDN telephone or an ISDN PBX to the FRITZ!Box, please read the sections “Connecting ISDN Telephones” on page 27 as well as “Connecting ISDN PBXs” on page 28.

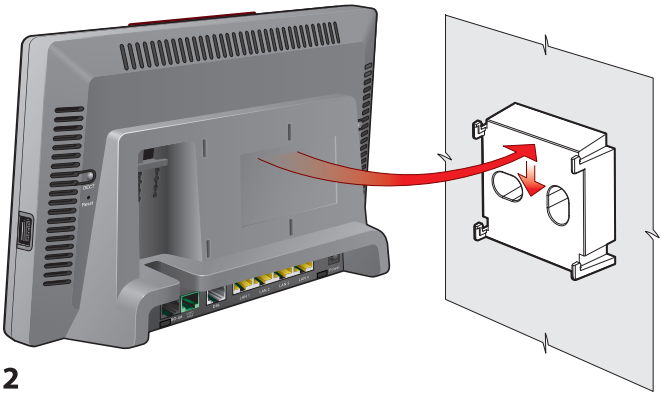
3.2 Mounting on a Wall

Mount the wall holder included in the package on the wall.



Mounting the wall holder for the FRITZ!Box

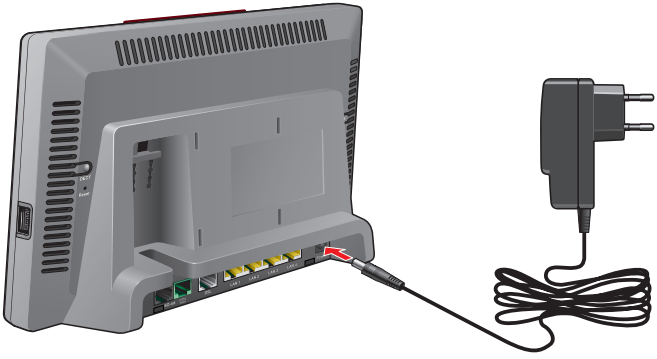
Place the FRITZ!Box on the wall holder and slide it into position.



2

Attaching the FRITZ!Box to the wall holder

3.3 Connecting to Electrical Power



Connecting to the power supply

Connecting Set aside the power supply unit out of the FRITZ!Box package.

1. Connect the power supply unit to the socket on the FRITZ!Box labeled “Power”.
2. Plug the other end into an AC power outlet.

The green “Power/DSL” LED will begin flashing after a few seconds.

3.4 Connecting the Computer(s)

If you would like to surf the web using the FRITZ!Box or to open the FRITZ!Box user interface, then you must connect a computer with the FRITZ!Box.

A computer can be connected with the FRITZ!Box in two different ways:

- via a LAN port
- wirelessly via WLAN

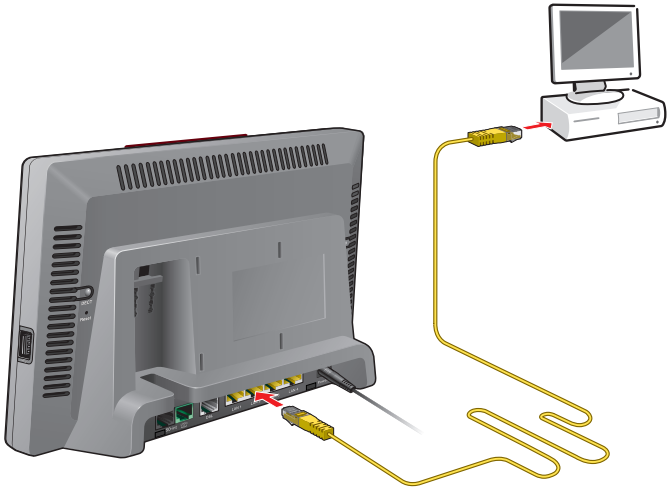
Connection Szenarios

Note the following when connecting computers to the FRITZ!Box:

- **One** computer can be connected to the FRITZ!Box by only **one** of these means.
- At each of the network ports of the FRITZ!Box, a computer can be connected directly or via a hub/switch.
- Using WLAN you can connect multiple computers with the FRITZ!Box at the same time.
- The computer is connected to the FRITZ!Box in the same way regardless of the operating system on the computer.
- All of the computers connected with the FRITZ!Box constitute a network.

3.5 Connecting Computer(s) to the LAN Port

If you want to connect a computer to one of the four LAN ports on the FRITZ!Box, make sure that your computer is equipped with a network adapter. A LAN port is usually designated by the icon at left or labeled “LAN”.



Connecting a computer to a LAN port on the FRITZ!Box

Connecting

Set aside the network cable (yellow) from the FRITZ!Box package.

1. Switch on your computer.

   If you work with a Linux operating system, use YaST to configure your network card with the setting “DHCP”, if this setting is not already configured.

2. Insert one end of the LAN cable to the computer’s network adapter.

3. Connect the other end of the LAN cable to a socket on the FRITZ!Box labeled “LAN 1”, “LAN 2”, “LAN 3” or “LAN 4”.

Now the FRITZ!Box and computer are connected to each other.

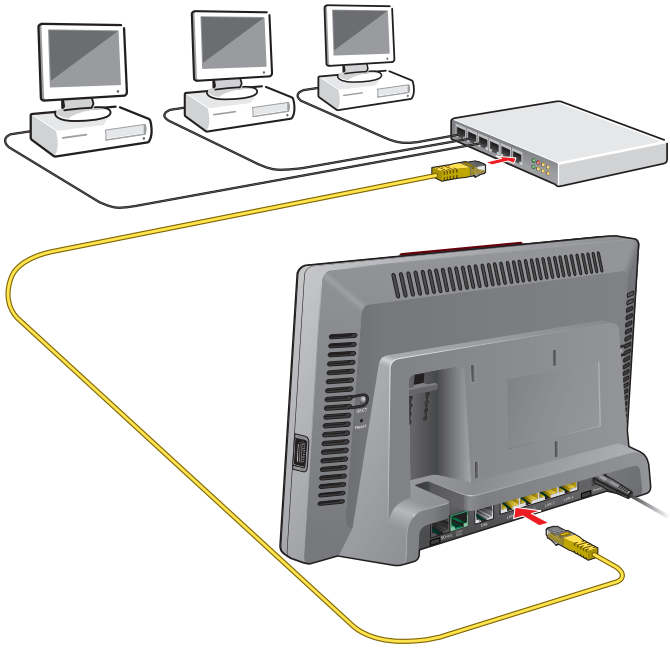
Connecting More Computers to the LAN Ports

Additional cables are required to connect further computers. In purchasing a LAN cable, note the instructions in the section “Network Cable” on page 120.

You can connect a computer to any of the four LAN ports of the FRITZ!Box at any time.

Connecting a Network Hub or Switch

You can connect a network hub or switch to one of the LAN ports on the FRITZ!Box if you would like to connect multiple computers to the FRITZ!Box via LAN.



Connecting FRITZ!Box to a network hub

Connecting

Set aside the network cable (yellow) from the FRITZ!Box package.

1. Connect one end of the LAN cable to the uplink port of the network hub or switch.
2. Connect the other end of the cable to one of the LAN sockets on the FRITZ!Box.

The FRITZ!Box and the network hub are now connected with each other.

3.6 Connecting Computer(s) Wirelessly via WLAN

Using WLAN you can connect one or multiple computers with the FRITZ!Box wirelessly.

The wireless WLAN connection is independent of the operating system used. Each computer to be connected to the FRITZ!Box via WLAN must support WLAN, by means of a compatible WLAN adapter, for instance the FRITZ!WLAN USB Stick N.

For more information on WLAN, see the section “More about WLAN” from page 125.

Connecting the FRITZ!WLAN USB Stick

Connect

If you are using a FRITZ!WLAN USB Stick N or a FRITZ!WLAN USB Stick by AVM as a WLAN adapter, you can transmit the security settings of the FRITZ!Box to your FRITZ!WLAN Stick quickly and conveniently using AVM Stick & Surf. Proceed as follows to do so (described here using the example of the FRITZ!WLAN USB Stick N):

1. Switch on your computer.
2. Insert the AVM FRITZ!WLAN USB Stick N into the USB port on the FRITZ!Box. The “INFO” LED on the FRITZ!Box begins flashing rapidly.

   The WLAN security settings are being transferred to the FRITZ!WLAN USB Stick N. As soon as the “INFO” LED stops flashing, transmission of the settings has been concluded.
3. Remove the FRITZ!WLAN USB Stick N.

4. Now insert the FRITZ!WLAN USB Stick N in the USB port of the computer.

The security settings saved on the FRITZ!WLAN USB Stick N are applied to the computer. Now the FRITZ!Box and FRITZ!WLAN USB Stick N are connected with each other wirelessly

.

For more information, see the manual for the AVM FRITZ!WLAN USB Stick N or the manual for the AVM FRITZ!WLAN USB Stick.

Using WLAN adapters from Other Manufacturers

Installing

Proceed as follows to install a WLAN adapter from another manufacturer:

1. Switch on your computer.
2. Install the WLAN adapter in your computer along with the appropriate software. Please take note of the instructions in the documentation of the adapter.
3. In order to establish a WLAN connection to the FRITZ!Box, you must either use the WLAN software supplied with the operating system, or the manufacturer's WLAN software included in the WLAN adapter package.

Establishing a Connection

The FRITZ!Box is delivered with preset values for WLAN security. You must enter these values during the configuration of the WLAN adapter.

If you would like to establish a WLAN connection using these preset values, then your WLAN adapter must support WPA encryption.

1. Start the WLAN software.
2. Enter the following for the connection between the FRITZ!Box and the WLAN adapter:

SSID (name of the WLAN radio network)	FRITZ!Box Fon WLAN 7570 vDSL
Encryption method	WPA (TKIP) or WPA2 (AESCCMP)
Encryption	WPA PSK
Key	The key is printed on the stickers on the base of the device and on the cover of the FRITZ!Box CD.
Network mode	Infrastructure

3. Confirm your entries using the relevant button in the user interface (for instance, “OK” or “Connect”).

Now your WLAN adapter and the FRITZ!Box are connected with each other wirelessly.

Please see the instructions in the section “Opening the User Interface” on page 29. See also the information on WLAN security in the section“Security” from page 127.

WPA Not Supported

If your WLAN adapter does not support WPA, you must convert the encryption in the FRITZ!Box to WEP. For this you must change the WLAN settings in the FRITZ!Box. To do so, proceed as follows:

1. Connect the FRITZ!Box and the computer using the network cable (yellow) (see the section “Connecting Computer(s) to the LAN Port” on page 18).
2. Start a web browser on the computer.
3. Enter fritz.box in the address line of the browser.
4. Select the “Advanced Settings / WLAN / Security” menu in the “Settings” area.
5. Then select WEP encryption and enter a network key.
6. Click the “Apply” button.

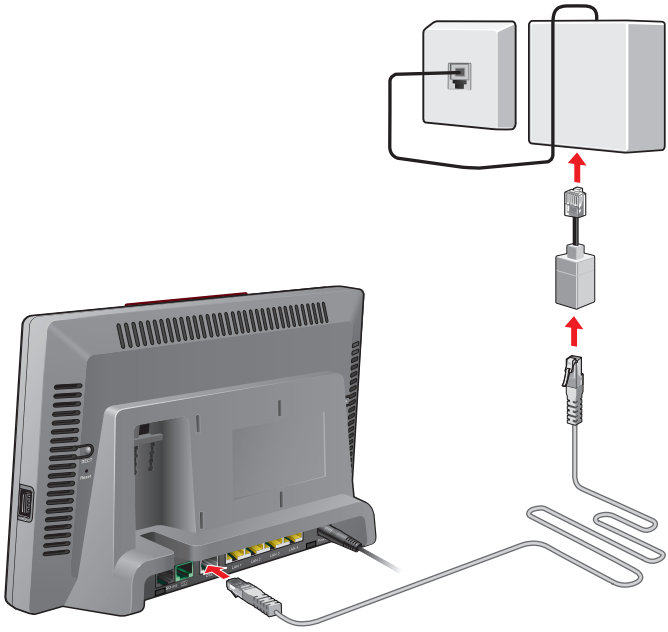
   A window is displayed with the WLAN security settings.
7. Print out the page by clicking the printer icon in the toolbar.

8. Close the user interface and clear the connection between the FRITZ!Box and the computer. Remove the network cable (yellow).

9. Configure your WLAN adapter with the security settings entered in the FRITZ!Box.

The WLAN connection between your WLAN adapter and the FRITZ!Box will be established.

3.7 Connecting to the DSL/VDSL Line



Connecting to the DSL/VDSL splitter

Connecting

The gray cable is for connecting to the DSL/VDSL splitter. This cable is a combination of a DSL and VDSL cable.

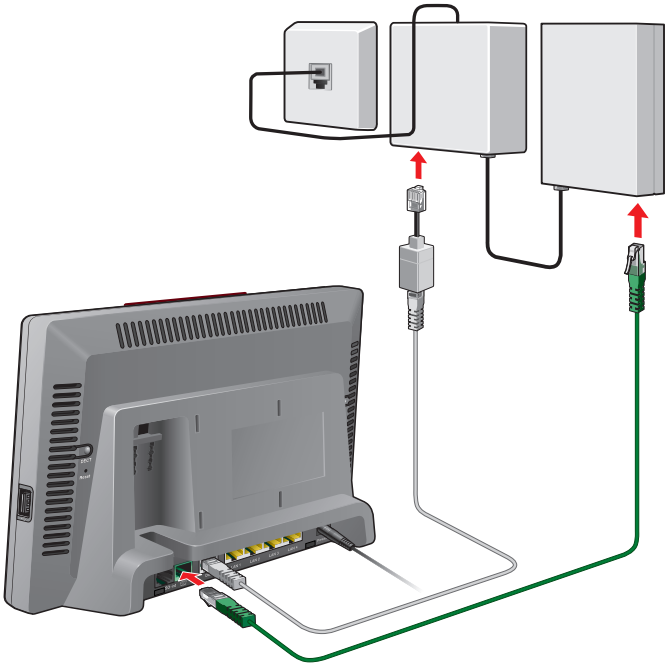
1. Connect the longer of the two gray branches of the cable to the port labeled “DSL/TEL”.
2. Then connect the other end of the cable to the corresponding socket on the DSL/VDSL splitter. If the end of the cable does not fit into the socket on the splitter, insert the end of the cable into the gray RJ45/RJ11 adapter included in the package and then insert the adapter into the socket on the DSL/VDSL splitter.

   The green “Power” LED stops flashing after a short time and remains lit to signalize that FRITZ!Box is ready for Internet connections over DSL or VDSL.

3.8 Connecting to the ISDN Line

Your telephone line is either an analog line or an ISDN line.

If you have an ISDN line, read here how to connect the FRITZ!Box with the ISDN line.



Connecting to the ISDN NT

Connecting

Set aside the green cable delivered in the package.

1. Connect one branch of the cable to the socket on the FRITZ!Box labeled "☎".
2. Insert the other branch of the cable into the socket of your ISDN NT.

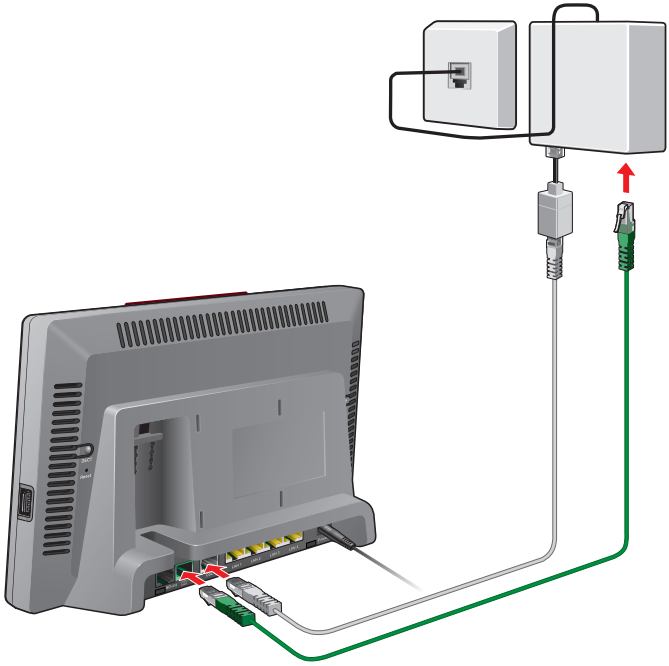
   If the end of the cable does not fit into the socket on the splitter, insert the end of the cable into the gray RJ45/RJ11 adapter included in the package and then insert the adapter into the socket of the ISDN NT.

Now the FRITZ!Box and the ISDN line are connected.

3.9 Connecting with the Analog Telephone Line

Your telephone line is either an analog line or an ISDN line.

If you have an analog telephone line, read here about how to connect the FRITZ!Box with the analog telephone line.



Connecting to the analog telephone line via the DSL/VDSL splitter

Connecting

Set aside the gren cable delivered in the package.

1. Connect the longer gray branch of the cable to the socket on the FRITZ!Box labeled "☎".
2. Then insert the black plug into the appropriate socket of your DSL/VDSL splitter.

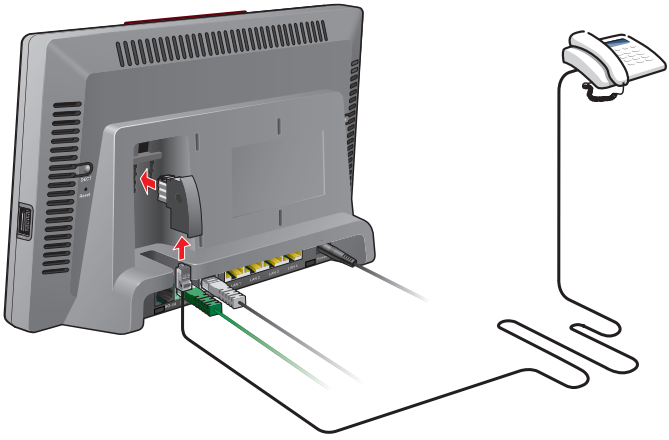
   If the plug does not fit into the splitter, connect the end of the cable to the black RJ45/RJ11 adapter included in the package and then insert the adapter into the socket on the DSL/VDSL splitter.

Now the FRITZ!Box and the analog telephone line are connected.

3.10 Connecting Telephone, Fax, or Answering Machine

The FRITZ!Box provides Internet and/or fixed-line telephony for analog terminal devices.

You can connect two analog terminal devices like telephones, fax machine or answering machine to the FRITZ!Box. Insert the TAE plug of your analog device in one of the TAE sockets "FON 1" or "FON 2" located on the back panel of the FRITZ!Box.

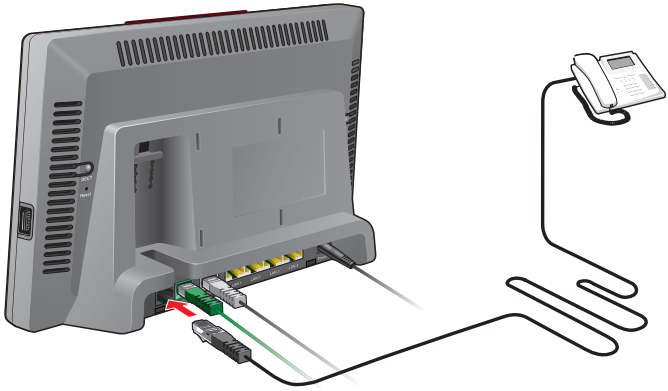


Connecting an analog telephone to an RJ11 jack

Analog devices with an RJ11 plug are connected to the RJ11 sockets “FON 1” or “FON 2” located on the back panel of the FRITZ!Box using the TAE/RJ11 adapter included in the package.

3.11 Connecting ISDN Telephones

ISDN telephones can be connected to the FRITZ!Box and used to make calls via the Internet and the fixed-line network. With appropriate cabling, up to eight ISDN telephones can be connected.



Connecting an ISDN telephone to the FRITZ!Box

Connecting

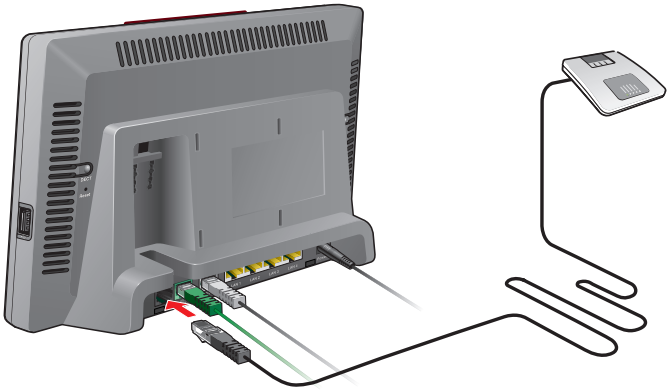
Use an ISDN cable to connect an ISDN telephone.

1. Connect one end of the ISDN cable with the ISDN telephone.
2. Connect the other end of the ISDN cable with the “S_0-int” port of the FRITZ!Box.

3.12 Connecting ISDN PBXs

If you have an ISDN PBX, you can connect this PBX to the FRITZ!Box. With the telephones connected to the PBX you can make calls both via the Internet and via the fixed-line network.

The ISDN PBX must support a point-to-multipoint line.



Connecting an ISDN PBX to the FRITZ!Box

Connecting

Use an ISDN cable to connect an ISDN PBX.

1. Connect one end of the ISDN cable with the ISDN PBX.
2. Connect the other end of the ISDN cable with the "S_0-int" port of the FRITZ!Box.

If you have no more than two analog devices connected to the PBX, you can connect them directly to the FRITZ!Box and do without the PBX.

4 Opening the User Interface fritz.box

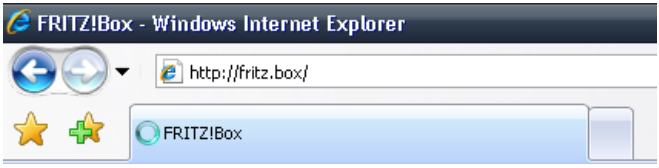
The FRITZ!Box has a user interface that can be used in a web browser.

The user interface presents information about the FRITZ!Box product, ports and connections. This is also where you configure settings for operation of the FRITZ!Box.

The user interface can be opened from any computer connected with the FRITZ!Box. The settings are saved in the FRITZ!Box.

Starting

1. Start a web browser on your computer.
2. Enter fritz.box in the address line of the browser.



The “fritz.box” entry in the address field of a web browser

The FRITZ!Box user interface opens.

If the user interface does not open, please see the instructions in the section “Errors Opening the User Interface” on page 95.

Saving Settings

The settings you made in the FRITZ!Box can be saved as a file on your computer. This file contains all user-defined settings, including the account information for the Internet connection and telephony configuration. This settings file can be loaded back into your FRITZ!Box at any time.

The FRITZ!Box features a Wizard to accompany you step by step through the process of saving and restoring your settings.

5 Internet Connections
Setting Up the Internet Connection

In order to allow Internet access with the FRITZ!Box, you must first configure the Internet connection in the FRITZ!Box user interface.

The FRITZ!Box can be operated directly at the DSL or VDSL line. Alternatively, it can be connected to a cable modem, a DSL or VDSL modem, or a DSL router, or integrated into an existing network.

5.1 Configuring the Internet Connection Using the Wizard

If the FRITZ!Box is connected directly to the DSL/VDSL line, the account information from your Internet Service Provider is required to configure the Internet connection in the FRITZ!Box.

Use the Wizard to configure the Internet conneciton:

1. Open the FRITZ!Box user interface.
2. In the “Settings” area, please select the “Wizards” menu.
3. Click the “Configure Internet Connection” Wizard and follow the instructions.

Once configuration has been completed, all of the computers connected with the FRITZ!Box can be used to surf the Internet without any further settings required.

5.2 Configuring the Internet Connection Manually

Changes to the Internet connection settings can be made in the FRITZ!Box user interface.

Proceed as follows:

1. Open the FRITZ!Box user interface.
2. Select the “Advanced Settings” menu in the “Settings” area.
3. Select “Internet / Account Information”.
4. Configure the desired settings. Take advantage of the Online Help available in the FRITZ!Box user interface for more information and instructions.

5. As a final step, click “Apply”.

If the FRITZ!Box is connected to a cable modem, a DSL or VDSL modem or a router, or integrated into an existing network, you must also configure your Internet connection as described above. To do so, enable the expert mode in the “System / Expert Mode” menu.

6 The DECT Function
Cordless Telephony with FRITZ!Box

Thanks to the integrated DECT function, the FRITZ!Box Fon WLAN 7570 vDSL can be used as a basis station for cordless phones. Every cordless phone that supports the DECT-GAP standard (also known as a DECT telephone) can be registered at the FRITZ!Box. A total of up to five cordless phones can be registered.

6.1 Registering Cordless Phones

See the documentation of your cordless phone to find out whether it supports the DECT-GAP standard: only phones that support this standard can take advantage of the full range of FRITZ!Box features.

To register a cordless phone on the FRITZ!Box, please follow the corresponding instructions in your telephone manual.

Press and hold down the search key on the FRITZ!Box labeled “DECT” during the entire registration process. This facilitates telephone registration.

6.2 Making an Internal Call to a Cordless Phone

A cordless phone can also be called from another registered handset. To do so, proceed as follows:

1. Pick up the handset of a telephone connected to the FRITZ!Box.
2. Enter the keypad sequence corresponding to the cordless phone to be called.

   The keypad sequence is determined by the position at which the telephone is registered in the list of cordless phones in the FRITZ!Box user interface:

Position in the List of Cordless Phones	Keypad Sequence
Entry 1	✪✪6❶0
Entry 2	✪✪6❶❶
Entry 3	✪✪6❶❷
Entry 4	✪✪6❶❸
Entry 5	✪✪6❶❹

6.3 Logging a Cordless Phone off of the FRITZ!Box

1. Start a web browser.
2. Open the FRITZ!Box user interface by entering fritz.box in the address field.
3. In the “Start Menu” area, select the “Telephony Equipment” menu.

4. In the “Cordless Phones (DECT)” area, select the cordless phone you want to log off and click the “Delete” button.

Now the cordless phone will be logged off.

6.4 Switching the DECT Function On and Off

The DECT function is switched off upon delivery of the FRITZ!Box.

- Switching on the DECT function

  The DECT function is switched on when the first cordless phone is registered.

- Switching off the DECT function

  When the last cordless phone is logged off in the FRITZ!Box user interface, the DECT function is switched off automatically.

7 Telephone Connections
Configuring FRITZ!Box for Telephony

Using the FRITZ!Box you can make telephone calls via the Internet and the fixed-line network.

Once you have connected the FRITZ!Box as described in the chapter “Connecting” from page 13, you can configure the FRITZ!Box for making telephone calls.

The configuration is performed in two consecutive steps:

- entering your phone numbers
- configuring the connected telephony equipment

In the “Settings” area of the FRITZ!Box user interface there are Wizards for the configuration of your FRITZ!Box. We recommend using these step-by-step instructions.

7.1 Entering Your Phone Numbers

The “Enter Your Phone Numbers” Wizard assists you in performing the following tasks:

- entering Internet phone numbers
- entering fixed-line numbers
- changing numbers already entered
- deleting entered numbers

If you used the Basic Configuration Wizard after connecting your FRITZ!Box and entered numbers then, these numbers are already entered in your FRITZ!Box. In this case you can start right away with the configuration of the connected telephony devices.

Internet Telephone Number

In order to be able to make calls via the Internet with the FRITZ!Box, you will need an Internet telephone number from an Internet telephony provider.

You can enter multiple Internet numbers in the FRITZ!Box. The Internet numbers can be from one or from multiple different Internet telephony providers.

Fixed-line Number

With the FRITZ!Box you can make calls both via the analog fixed-line network and via the ISDN fixed-line network:

- In order to make calls via the analog fixed-line network with the FRITZ!Box, enter your telephone numbers in the FRITZ!Box.
- In order to make calls via the ISDN fixed-line network with the FRITZ!Box, enter your ISDN numbers in the FRITZ!Box.

7.2 Configuring Telephony Equipment

For the configuration of telephony equipment, the “Configure Telephony Devices” Wizard is available in the FRITZ!Box.

Telephony Devices Supported

The following telephony devices are supported by the FRITZ!Box:

- telephones
  - analog telephones
  - ISDN telephones
  - telephones with an integrated answering machine
  - cordless (DECT) phones

- answering machines

  If you have connected an analog answering machine (to “FON 1” or “FON 2”, for instance), configure it as an answering machine.

  The FRITZ!Box is also equipped with integrated answering machines, which can be enabled and configured in the “Settings / Advanced Settings / Telephony / Answering Machines” menu.

- ISDN telephone systems (PBXs)
  - ISDN PBXs for analog telephones
  - ISDN PBXs for ISDN telephones
- fax machines
  - analog fax machines
  - ISDN fax machines
  - fax-telephone combinations

Settings for Telephony Devices

The “Configure Telephony Devices” Wizard can assist you in configuring the following settings for telephony equipment in the FRITZ!Box:

- telephone
  - kind of connection used to connect the telephone with the FRITZ!Box
  - internal name for the telephone
  - number used to conduct outgoing calls: With this entry you specify whether outgoing calls should be conducted via the Internet or the fixed-line network.
  - call acceptance: Specify here whether the telephone should react to all calls or only to calls for certain telephone numbers.

- fax machine
  - kind of connection used to connect the fax machine with the FRITZ!Box
  - internal name for the fax machine
  - number used to send faxes: This entry defines whether outgoing faxes are sent via the Internet or the fixed-line network.
  - call acceptance: Here you define the numbers to which the fax machine should react.
- answering machine
  - kind of connection used to connect the answering machine with the FRITZ!Box
  - internal name for the answering machine
  - call acceptance: Enter here whether the answering machine should react to all calls or only to calls for certain numbers.
- ISDN PBX

  The Wizard explains step by step how to prepare the ISDN telephone system for operation at the FRITZ!Box.

7.3 Functions and Settings for Telephony

More functions and settings options for telephony are available in the “Settings / Advanced Settings / Telephony” menu.

Call List

The Call List displays outgoing calls and sent faxes, incoming calls and faxes, as well as incoming calls in absence.

If the number of a caller or someone called is entered in the Telephone Book, the Call List will display the name from the Telephone Book.

The Call List can be saved as a file.

Telephone Book

A Telephone Book is at your disposal in the FRITZ!Box.

If an AVM handset is registered at the FRITZ!Box, the Telephone Book can be transferred to the handset.

Call Diversion

With this function you can divert incoming calls to another number. The following kinds of call diversion are available:

- diversion of all incoming calls to a certain telephone number
- diversion of calls for certain numbers
- diversion of calls to other telephones connected with the FRITZ!Box
- diversion of calls that come from a certain telephone number

Blocking Calls

The telephone number block of the FRITZ!Box offers you the following options:

- blocking numbers and ranges of numbers for outgoing calls

  From the FRITZ!Box no outgoing calls to a blocked number range are possible. In this manner you can block connections to certain mobile networks, for instance.

- blocking telephone numbers for incoming calls

  For incoming calls you can block certain numbers to avoid receiving calls from unwanted callers.

Alarm

With this function you can use the telephones connected to the FRITZ!Box as alarm clocks.

- You can specify several different times for the alarm to go off.
- An individual telephone can be selected for the alarm function.

Dialing Rules

Dialing rules specify when calls are conducted on the fixed-line network, and when they take place over the Internet.

All connections to number ranges for which a dialing rule has been defined are established using the specified connection type.

Answering Machines

The FRITZ!Box is equipped with several integrated answering machines, each of which can be enabled and configured individually.

By enabling the setting “Send messages by e-mail” you can have recorded messages sent to you by e-mail. The messages are sent as audio files.

To check an answering machine internally, enter the following keypad sequences:

Answering machine 1	✪✪600
Answering machine 2	✪✪601
Answering machine 3	✪✪602
Answering machine 4	✪✪603
etc.	etc.

7.4 The Answering Machine Menu

Main menu

❶ Play back messages

If no messages have been recorded, you hear two short audio signals and return to the main menu.

- ❶ Pause / Play
- ❺ Delete message
- ❼ To previous message
- ❾ To next message
- ❿ Listen to “Play back messages” menu again
- # Back to main menu

❷ Delete old messages

- ❺❷ Delete all old messages
- ❿ Listen to “Delete messages” menu again
- # Back to main menu

❸ Switching the answering machine on / off

❹ Switching the answering and recording mode on / off

❺ Record greetings

- ❶ Record greeting and message greeting
- ❷ Record announcemenmt
- ❸ Closing message

  Recording and selection

  - ❶ Listen to all recordings
  - ❷ Select a greeting during monitoring
  - ❽ Record greeting › End with 1
  - ❿ Listen to “Recording and Selection” menu again
  - # Back to Main menu
- ❿ Listen to “Record greetings” menu again
- # Back to main menu

❿ Listen to main menu again

8 USB Devices
USB Devices at the FRITZ!BoxUSB

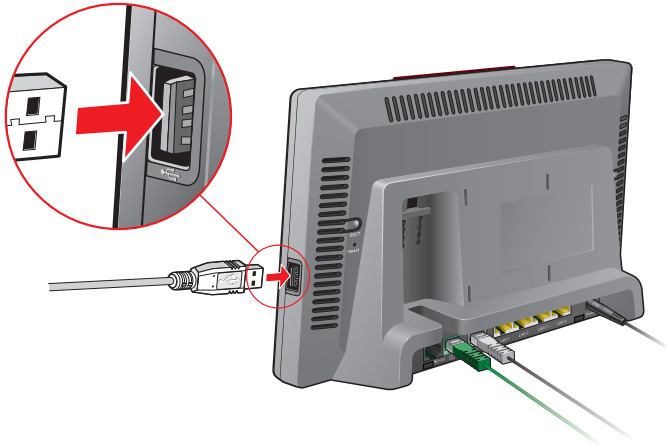
The FRITZ!Box is equipped with a USB port (also known as a USB host controller). Various USB devices can be connected to the host controller:

- an AVM FRITZ!WLAN USB Stick N or an AVM FRITZ!WLAN USB Stick
- a USB mass storage device (hard drive, memory stick)
- a printer
- a USB hub

  You can connect two USB mass storage devices and one USB printer, or three USB mass storage devices to the USB hub.

The USB port of the FRITZ!Box supports the USB 1.1 and USB 2.0 standards.

8.1 Connecting USB Devices



Connecting a USB cable to the USB port

Connection

Some USB devices, such as memory sticks or the FRITZ!WLAN USB Stick N, are inserted directly into the USB port on the FRITZ!Box. Other devices like USB printers are connected to the USB port by means of a USB cable.

8.2 Accessing USB Devices

Network Access

As soon as a USB device is connected to the FRITZ!Box, all of its functions are available in the entire network:

- The files in the USB mass storage can be accessed from the network via FTP (File Transfer Protocol), or you can make the USB mass storage device available as a network storage device.
- USB printers are available as network printers.

USB Remote Connection

With the USB remote connection, a computer in the network can use USB devices just as if they were connected directly to the computer via the USB cable.

The USB remote connection is enabled for each USB device class individually (USB printer, USB storage and other USB devices).

While a computer accesses a USB device via the USB remote connection, the USB device is not available for other computers in the network.

8.3 FRITZ!Box USB Remote Connection

The USB remote connection can be used in Windows Vista (32-bit) and Windows XP (32-bit) with Service Pack 2 or higher.

With the FRITZ!Box USB remote connection you can control connections between your computer and USB devices. The computer and the USB devices are all connected with the FRITZ!Box.

A USB device connected to the FRITZ!Box is handed over to a computer via the USB remote connection function. The USB device is detected as new hardware by the operating system on this computer, so that device software can be installed as if it were connected directly to the computer. The USB remote connection can be enabled for various USB devices, such as USB mass storage devices, printers and scanners.

Please note that the FTP and USB network memory functions are not available as long as the USB remote connection is active for USB storage devices.

With the FRITZ!Box USB remote connection you can enjoy the full range of functions of your USB devices.

- USB storage devices can also be used with special file formats like NTFS.
- All-in-one printers can also be used for scanning and faxing.

Isochronal USB devices with time-critical data transmission (like, for instance sound cards, web cams, video converters or TV adapters) are not supported.

Enabling the USB Remote Connection

Work through the following steps in order to enable the USB remote connection on your computer:

1. Start a web browser on your computer.
2. Enter fritz.box in the address line of the browser.
3. Select the “Advanced Settings” menu in the “Settings” area.
4. Enable the expert mode option of the FRITZ!Box in the “System / Expert Mode” menu. Confirm by clicking “Apply”.
5. Open the “USB Devices / Device Overview” menu.
6. Select the setting “Enable USB remote connection” and click “Apply”.

7. Open the “USB Remote Connection” menu and install the program for the USB remote connection on the computer from which you want to use the USB devices. Follow the instructions on the “USB Remote Connection” page.

   The program can be implemented in Windows Vista (32-bit) and Windows XP (32-bit) with Service Pack 2 or higher.

8. The next step is to specify for which kind of USB devices the USB remote connection should be enabled. Enable the desired options.

9. As a final step, click “Apply”. All USB devices connected to the FRITZ!Box will be detected again.

The result of the changed USB settings can be viewed in the “Device Overview”.

Disabling the USB Remote Connection

Perform the following steps to disable the USB remote connection:

1. Open a web browser on the computer for which the USB remote connection is to be disabled.

2. Enter fritz.box in the address line of the browser.

3. Select the “Advanced Settings” menu in the “Settings” area.

4. Enable the expert mode option of the FRITZ!Box in the “System / Expert Mode” menu. Confirm by clicking “Apply”.

5. Open the “USB Devices / USB Remote Connection” menu.

6. Disable all types of USB devices.

7. As a final step, click “Apply”.

The result of the changed USB settings can be viewed in the “Device Overview”.

8.4 USB Mass Storage Devices

USB mass storage devices include hard drives and memory sticks.

File Systems

The USB mass storage supports the file systems FAT, FAT32 and NTFS.

Connecting

A USB storage device can be connected either directly to the USB port or via the USB hub (see the section “USB Hub” on page 55).

Please also see the “Tips for Using USB Devices” on page 56.

Access Rights and Passport Protection

The access rights and password protection are valid for all USB mass storage devices. It is not possible to assign a different password for each individual mass storage device. The access rights and password are are not enabled if the USB remote connection is enabled for all USB mass storage devices.

Access Rights and Passwort Protection

On the FRITZ!Box user interface you can configure access rights and password protection for the USB storage devices.

1. Start a web browser.
2. Enter fritz.box in the address field.
3. Select the “Advanced Settings” menu in the “Settings” area.
4. Select the “USB Devices / Mass Storage Device” menu.
5. Configure the access rights and password protection for the USB mass storage devices.

Accessing the Data in the USB Mass Storage

USB storage devices connected to the FRITZ!Box directly or via a USB hub are displayed with their device name in the “USB Devices / Device Overview” menu on the user interface.

FTP (File Transfer Protocol)

All of the computers in the network can access the data in the USB mass storage simultaneously via FTP.

Access via FTP is possible only if the USB remote connection is disabled for USB storage devices.

Click on the name of the USB storage device in the “USB Devices / Device Overview” menu or open a web browser and enter FTP://fritz.box in the address field. The folder structure of the USB storage device is displayed in the web browser.

The data in the USB storage device can be accessed via FTP using any FTP client.

Files from the USB storage device cannot be executed or opened in a suitable program until they have been copied to your computer or your local network.

USB Network Memory

The FRITZ!Box offers you the possibility of making USB mass storage devices available in the Windows network as network drives (Samba). Files in the USB memory then can be opened and processed directly on the USB mass storage device.

Files are supported up to a size of 4 GB.

Access to USB network memory is only possible if the USB remote connection is disabled for USB storage devices.

FRITZ!Musikbox

With this feature music files on the USB storage device can be played back by compatible devices (streaming). The hard drive with the music collection is simply connected to the USB port of the FRITZ!Box and a suitable playback device is integrated into the local network.

The devices automatically communicate via Universal Plug and Play (UPnP). This technology allows the devices connected to each other by cable or radio network to perform automatic detection, recognize events, and exchange data with each other accordingly. With UPnP AV this technology has been expanded to audio and video contents.

The FRITZ!Musikbox makes files available in the MP3, WMA or WAV format.

8.5 USB Printers

You can connect a USB printer to the USB port and either enable the USB remote connection, or use the USB printer as a network printer.

If you enable the USB remote connection for USB printers, then you can use the printer on another computer just as if it were connected directly to your computer.

When configured as a network printer, the USB printer can be used simultaneously by all of the computers connected to the FRITZ!Box.

If you would like to connect a USB printer, please note the following:

- Only printers that can be addressed with the device class “Printer” are supported as network printers. This is not the case for some all-in-one printers, for instance combined fax-scanner-printers.
- Host-based printers that work according to the GDI system, for instance, and require bidirectional communication for status messages, can only be used via the USB remote connection. These printers usually can be used only with an operating system for which the printer manufacturer has provided driver software.

  Such printers connected to the FRITZ!Box are not supported as network printers.

- When the USB remote connection is enabled, all-in-one printers (printers with supplementary fax or scanner functions) can also be used for faxing and scanning.

  If the USB printer is operated as a network printer, only the printing function is supported.

- If your printer is equipped with a status monitor, you can use this feature when the USB remote connection is enabled.

  If the printer is used as a network printer, it may not be possible to utilize the status monitor.

- For computers with Linux:

  The printer must be supported by CUPS (Common UNIX Printing System) software and be detected correctly at the USB port of the FRITZ!Box.

- For Apple computers:

  The only printers that can be used are the ones whose drivers can be selected in the “Printer” utility or for which a compatible driver is available there.

If you want to use the printer as a network printer, the printer port must be configured, and the suitable printer drivers installed, on every computer. Print jobs are forwarded to the IP address of the printer server in the local network via the printer port.

If you want to use the printer with the USB remote connection enabled, then any computer that is to use the printer must have the program for the USB remote connection (see page 44) and the suitable printer drivers installed.

Configuring the Printer Port in the Windows Operating Systems

If the “FRITZ!Box” entry is already listed in the “Programs” group of the start menu of the computer, this means that the printer port is already configured on this computer.

Otherwise, work through the following steps to configure the printer port:

1. Insert the FRITZ!Box CD in your CD-ROM drive.

   The installation Help is started.

2. Click the “View CD Contents” button.

3. Click the “Start Menu Entry” button.

   The printer port designated “AVM: (FRITZ!Box USB Printer Port)” will be configured.

Now you can install the printer driver of the printer connected to FRITZ!Box for this printer port.

Installing Printer Drivers in Windows Vista

1. Click the “Start” button in the task bar and select the “Control Panel”.

2. Select “Printers”.

3. Click “Add Printer”.

4. Select “Add a local printer”.

   You must make this selection because the printer port on the computer functions as a local port.

5. Select the setting “Use an existing port” and then choose the entry “AVM: (FRITZ!Box USB Printer Port)” from the list. Click “Next”.

6. Select the manufacturer for the USB printer connected to the FRITZ!Box from the “Manufacturers” list and then select the exact model from the “Printers” list.

   If the manufacturer or the model is not included in the lists, use an installation disk or CD with the required files and click “Have Disk...”.

7. You can enter a name for the printer in the “Printer Name” field. The operating system will use this name to administer the printer.

8. Conclude the installation by clicking “Finish”.

Installing Print Drivers in Windows XP/2000

1. Open the start menu of the computer and click the “Printers and Faxes” entry (Windows XP) or click “Start / Settings / Printer” (Windows 2000).

2. In the “Printers and Faxes” window, click “Add a printer in the “Printer Tasks” area on the left hand side.

   The “Add Printer” Wizard will be started.

3. Click “Next”.

4. Select the option “Local printer attached to this computer” (Windows XP) or “Local Printer” (Windows 2000) and make sure that the setting “Automatically detect and install my Plug and Play printer” is disabled.

   You must make this selection because the printer port on the computer functions as a local port.

5. Click “Next”.

6. In the “Select a Printer Port” window, select the option “Use the following port” and select “AVM: (FRITZ!Box USB Printer Port)” from the list field. Click “Next”.

7. Select the manufacturer for the USB printer connected to the FRITZ!Box from the “Manufacturers” list and then select the exact model from the “Printers” list.

   If the manufacturer or the model is not included in the lists, use an installation disk or CD with the required files and click “Have Disk...”.

8. In the “Name Your Printer” window, answer the question “Do you want to use this printer as the default printer?” (Windows XP) or “Do you want your Windows-based programs to use this printer as the default printer?” (Windows 2000) with “No”.

Setting Up Printers in SUSE Linux Systems

A USB printer can be connected to the USB port of the FRITZ!Box for use as a network printer. The printer is then available to all computers connected with the FRITZ!Box.

Install the printer as “root” or “superuser”.

1. Open a console and enter the following command:

   lpadmin -p ‹printer_name› -E -v socket://‹IP_address_of_the_FRITZ!Box›:‹port_number› -m ‹printer_description_file.ppd›

2. For more information and instructions, go to the following web site:

   http://www.cups.org/man/lpadmin.html

Example

For a laser jet printer with the example name of *Laserjet4* and the PPD file *laserjet.ppd* at a FRITZ!Box with the default address 192.168.178.1, on the console you must enter:

lpadmin -p Laserjet4 -E -v socket://192.168.178.1:9100 -m laserjet.ppd

You can view the PPD files installed in the system with the following command:

lpinfo -m

For More Information

Please direct any questions about PPD files to the manufacturer of the printer or system used. More detailed information on the CUPS printing software is included in the following documentation:

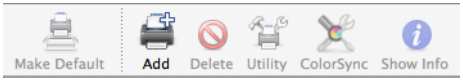
http://www.cups.org/documentation.php

Configuration questions should also be directed to the manufacturer of the Linux distribution or to an Internet or usenet forum that deals with CUPS or the distribution used.

Setting Up USB Printers on Apple Computers

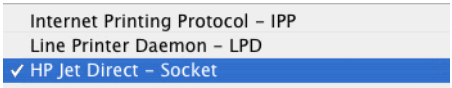
A USB printer can be connected to the USB port of the FRITZ!Box for use as a network printer. The printer is then available to all computers connected with the FRITZ!Box.

1. Under “Go / Utilities”, open the “Printer Setup Utility”.
2. Click “Add”.



3. Select “IP Printer”.

4. In the “Protocol” field, select the entry “HP Jet Direct – Socket”.



5. Enter in the “Address” field the IP address of the FRITZ!Box:

   192.168.178.1

6. Leave the “Queue:” field empty.
7. Enter the desired values in the “Name:” and “Location:” fields.
8. Enter a driver compatible with your printer in the “Print Using:” field.

If the printer cannot be selected, it may be possible to select a compatible printer or printer driver.

9. Click the “Add” button to save your settings.

The printer is then available to all computers connected with the FRITZ!Box.

Information about compatible printers or printer drivers is available in the Internet, for instance on the following page:

http://gutenprint.sourceforge.net/p_Supported_Printers.php3

8.6 FRITZ!WLAN USB Stick N and FRITZ!WLAN USB Stick

The FRITZ!WLAN USB Stick N and the FRITZ!WLAN USB Stick are WLAN adapters manufactured by AVM for connection to a computer. Using a WLAN adapter you can connect the computer wirelessly with the FRITZ!Box.

FRITZ!WLAN USB Stick N

The FRITZ!WLAN USB Stick N supports all WLAN features of your FRITZ!Box.

- the WLAN standards IEEE 802.11 n+g+b in the 2.4-GHz frequency band, and alternatively
- the WLAN standards IEEE 802.11 n+a in the 5-GHz frequency band.

For more information, see the section “More about WLAN” from page 125 and the manual for the FRITZ!WLAN USB Stick N.

FRITZ!WLAN USB Stick

If you are using the FRITZ!WLAN USB Stick with your FRITZ!Box, the WLAN standards IEEE 802.11g+b are supported in the 2.4-GHz frequency band.

For more information, see the section “More about WLAN” from page 125 and the manual for the FRITZ!WLAN USB Stick.

AVM Stick & Surf

With the AVM Stick & Surf technology it is easy to establish a secure WLAN connection. Stick & Surf is possible with the FRITZ!WLAN USB Stick N and with the FRITZ!WLAN USB Stick.

1. Insert the your stick into the USB port on the FRITZ!Box.

   The WLAN security settings are transmitted automatically to the FRITZ!WLAN USB Stick. The “INFO” LED on the FRITZ!Box begins flashing rapidly.

   As soon as the “INFO” LED stops flashing, transmission of the settings has been concluded.

2. Remove the FRITZ!WLAN USB Stick from the device.

3. After the security settings have been transmitted automatically, you can insert the FRITZ!WLAN USB Stick in a computer.

Now the FRITZ!WLAN USB Stick is ready to establish a connection to the FRITZ!Box. No further settings are necessary.

8.7 USB Hub

A USB hub can be connected to the USB host controller. A USB hub is a device to extend existing USB ports.

You can connect two USB mass storage devices and one USB printer, or three USB mass storage devices (like a hard drive or memory stick) to the USB hub.

We strongly advise to use a USB hub with its own power supply.

8.8 Tips for Using USB Devices

USB Devices

When using USB devices at the USB port of the FRITZ!Box, please keep in mind the following;

- If more than one USB device without its own power supply is connected to the FRITZ!Box, note that, in accordance with the USB specification, the total current consumption may not exceed a value of 500 mA. Otherwise unspecified malfunctions with the USB devices or even damage to the FRITZ!Box may occur.
- AVM expressly advises against installing firmware updates for USB devices connected to the computer via the USB remote connection on the FRITZ!Box.

USB Mass Storage Devices

When using a USB storage device at the USB port of the FRITZ!Box, please keep in mind the following:

- Before removing the USB storage device, select the “Remove safely” option in the FRITZ!Box user interface to prevent losses of data.
- To avoid damage to the FRITZ!Box, operate USB storage devices that require more than one USB port for operation (for instance hard drives with a Y cable) only if they have their own power supply or a USB hub with its own power supply.
- AVM has no influence over external interference to the USB storage devices on the FRITZ!Box. Thus such phenomena as voltage spikes during storms may occur, and writing to older USB memory devices may corrupt the data structure due to a high number of defective structures. In such cases a complete loss of data may occur.

  Therefore AVM recommends always making a security copy of the USB memory content so that your data are not irretrievably lost.

9 FRITZ!DSL: The Software Suite
Using DSL with the FRITZ!Box

The FRITZ!DSL software includes a number of programs designed for use with DSL, all of which are introduced briefly in this chapter.

Once you have installed FRITZ!DSL, the “Start Center” icon appears on your desktop. All of the programs in the software package are integrated in the Start Center, from where they can be started directly.

The Start Center contains the following buttons:

The “Internet” button starts the FRITZ!DSL Internet program. FRITZ!DSL Internet is the Internet monitoring software for your FRITZ!Box, with which you receive more detailed information about your current Internet connection.

The “Protect” button starts the FRITZ!DSL Protect program, which checks the Internet connections and supplements the firewall functions of your FRITZ!Box.

Click the “FRITZ!Box” button to open the user interface of FRITZ!Box in your web browser.

Click the “Update” button to check whether a firmware update for your FRITZ!Box is available on the AVM web site.

The “Diagnosis” button starts the FRITZ!DSL Diagnosis. This programs displays all relevant data about your DSL connection and checks the connection to your FRITZ!Box.

A click on the “Web Test” button starts the WebWatch program, which can measure the quality of your Internet connection to any remote site.

For comprehensive information about the FRITZ!DSL programs, see the corresponding Online Help files.

9.1 Installing FRITZ!DSL

1. Insert the FRITZ!Box CD and start “Setup.exe”.
2. Select “View CD Contents / Install FRITZ!DSL”.
3. The “File Download” window opens. Select the “Open” button.
4. The FRITZ!DSL welcome screen appears. Confirm with “Continue”.
5. Specify the folder in which you want to install FRITZ!DSL on your computer. Confirm with “Continue”.
6. Next, specify the program group for FRITZ!DSL in the Start menu. Confirm with “Continue”.
7. Confirm with “Finish”.

Installation has been concluded.

9.2 FRITZ!DSL Internet

FRITZ!DSL Internet is the Internet monitoring software for your FRITZ!Box. For instructions on how to configure the program, see the corresponding Online Help.

As soon as an Internet connection has been established, FRITZ!DSL Internet presents you with information about the current Internet connection. When FRITZ!Box is used in combination with a router, the program displays the connection status, provides information about the course of data transmissions, and allows the Internet connection of FRITZ!Box to be established or cleared from the computer.

FRITZ!Box takes care of dialing into the Internet, firewall protection from unauthorized incoming connections, and keeps track of transmission volume and online time.

9.3 FRITZ!DSL Protect

FRITZ!DSL Protect protects your computer from unwanted Internet connections, supplementing the firewall functions of your FRITZ!Box. With FRITZ!DSL Protect you can check all Internet connections that are established or accepted by local programs on your computer. You can permit or prohibit individual programs from accepting connections: If an unknown program attempts to establish an Internet connection, you will be asked whether you wish to allow such a connection.

An overview shows the programs already set up in FRITZ!DSL Protect along with their access rights. A Journal grants you an overview of all successful and rejected attempts to access the Internet.

One of the most convenient functions offered by FRITZ!DSL Protect works in combination with the UPnP capability of the FRITZ!Box. If you have enabled the option “Allow changes to security settings over UPnP” in the FRITZ!Box, FRITZ!DSL Protect can release ports for incoming connections on the FRITZ!Box whenever they are needed by programs. For this capability you must activate the “Use Port Forwarding” option in the “Settings” of FRITZ!DSL Protect. In this manner you can participate in online activities like gaming without having to reconfigure the FRITZ!Box firewall functions manually.

9.4 FRITZ!Box

Click the “FRITZ!Box” button to open the user interface of the FRITZ!Box in your web browser.

9.5 Update

New firmware updates for FRITZ!Box are provided by AVM at regular intervals, free of charge. The updates can add new functions to your FRITZ!Box.

Click the “Update” button to check whether there is a new update available for the FRITZ!Box firmware.

When the FRITZ!DSL Start Center is started, the AVM web site is automatically checked for new updates at regular intervals. You will be informed when a new update is available.

9.6 FRITZ!DSL Diagnosis

FRITZ!DSL Diagnosis reports comprehensively about all of the details of the DSL connection, including data transmission and the activated fast-path mode. The comprehensive DSL diagnostics function makes it possible to monitor the FRITZ!Box connection and installation.

9.7 WebWatch

Click the “Web Test” button in the FRITZ!DSL Start Center to start the FRITZ!DSL WebWatch program. WebWatch tests the quality of your Internet connection, and displays the results of these test graphically.

Once any URL is entered, FRITZ!DSL WebWatch sends a signal to the destination address.

The measured response times and the path of the data packets through the Internet are displayed in a diagram.

10 Configuration and Operation at the Telephone
FRITZ!Box Keypad Sequences

Many of the FRITZ!Box functions and features can be configured and used over a telephone connected to a FRITZ!Box extension. Only tone-dialing (dual-tone multifrequency = DTMF) telephones can be used in configuration and operation. Pulse dialing telephones are not suitable.

The telephone network features can be used only if they are supported by your telephone network carrier and enabled on your telephone line.

Acknowledgment Tone

Entries input on the telephone are confirmed with acknowledgement tones (see also “Handset and Ring Patterns” on page 118):

- Entries made correctly are confirmed with a positive acknowledgement tone (a single tone of one second in length).
- If the entry was not successful, because of an incorrect key sequence, for instance, you hear a negative acknowledgment tone (an intermittent tone broken into intervals of about 0.25 seconds).

10.1 Configuring at the Telephone

Saving New Settings

In this section, saving refers to **all** current settings made in the FRITZ!Box. It is not necessary to save the configuration immediately after every change. You may first configure all of your settings as desired, and then save them permanently.

Permanent saving cannot be reversed. However, you can reprogram different settings or restore the FRITZ!Box to its factory settings.

Save Permanently	
✆	Pick up the handset.
#991**	Save all settings permanently by dialing the sequence shown at left.
✆	Hang up the handset.

Restoring Factory Settings

The FRITZ!Box can be reset to its condition upon delivery by restoring factory settings.

All settings you made in the FRITZ!Box—including the configured Internet connection—are deleted when the factory settings are restored.

Restore Factory Settings	
#991*1590 1590*	resets the FRITZ!Box to its condition upon delivery

After restoring factory settings, the FRITZ!Box is restarted.

Enabling/Disabling WLAN

The WLAN function can be switched on and off using the telephone keypad. This is especially comfortable when the WLAN function has been switched off. Simply use your telephone to turn it back on. This means that the WLAN function can be enabled without having use a wired connection to open the user interface.

Enable/Disable WLAN	
#96*1*	enables the WLAN function
#96*0*	disables the WLAN function

Do Not Disturb

You can enable the Do Not Disturb function for any telephone connected to FRITZ!Box in the user interface. When Do Not Disturb is enabled, the telephone will not ring. In configuring this function you can choose between enabling the function immediately and selecting a specific time period.

Immediately

When Do Not Disturb is enabled immediately, no incoming calls will be signaled at the specified extension. The Do Not Disturb setting will remain enabled until it is disabled.

Period

Alternatively, you can enter a Do Not Disturb period during which the telephone will not ring. At the extension for which a Do Not Disturb period is to be configured, define the period during which the phone should not ring and save your entries. Then enable Do Not Disturb. Do Not Disturb then automatically will be switched on daily at the time entered in the “Start” field and switched off again at the time defined in the “End” field.

Example: Do Not Disturb should be configured from 08:00 p.m. until 07:00 a.m. daily. Enter the value “2000” for ‹Start› and “0700” for ‹End›.

Disabling the Function

Both kinds of Do Not Disturb settings can be disabled by means of a keypad sequence.

Enable Do Not Disturb Effective Immediately	
#81‹Ext.›*00*	immediately enables Do Not Disturb for the extension entered as ‹Ext›

Enable Do Not Disturb for a Prescribed Period	
#80‹Ext.›* ‹Start›*‹End›*	defines the period for Do Not Disturb at extension ‹Ext.›
#991**	saves the settings
#81‹Ext.›*06*	enables Do Not Disturb for the defined period

Disable Do Not Disturb	
❶❽❶‹Ext.›❹❻❹	disables Do Not Disturb for extension ‹Ext.›

Alarm

The FRITZ!Box includes an alarm function. The alarm can be configured individually for each connected telephone.

First enter on the telephone the time at which you would like to be awakened and save this entry. Then enable the alarm function.

Example: The telephone should ring to wake you at 07:00 a.m. Enter the value “0700” as the ‹Time› and save this setting.

Configure the Alarm for a Telephone	
❶❽❽❶❹‹Time›❹ ‹Ext.›❹	defines for the extension ‹Ext.› the time at which the telephone should ring
❶❾❶❹❹	saves the settings

Enable/Disable the Alarm Function	
❶❽❽❶❹❹	enables the alarm function for all extensions for which an alarm time was set
❶❽❽❶#	disables the alarm function for all extensions

Call Diversion on the ISDN Line

Call forwarding is performed by the ISDN operator's switching station. To use call forwarding, FRITZ!Box must be connected to an ISDN line. Then this feature can be used to forward calls to an external line. Call forwarding is subject to charges by the network provider and cannot be used to forward calls to Internet numbers.

In addition to call forwarding, there is also call diversion via the FRITZ!Box. Use this kind of call diversion to divert calls to internal and external lines. See the section "Call Diversion" on page 71 for more information.

Do not activate both call forwarding and call diversion at the same time.

For call forwarding you may specify whether you want incoming calls to be forwarded unconditionally, after the fifth ring, or when busy. Different settings may be configured separately for each number.

Call Forwarding Immediately

Incoming calls for the given MSN are always diverted immediately to the specified number. Call forwarding is subject to charges by the network provider and cannot be used for forwarding calls to Internet numbers.

Call Forwarding Immediately for Your Outgoing Caller ID	
✆	Pick up the handset.
✱❷❶✱‹DNo›#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
✆	Hang up the handset.

Call Forwarding Immediately for Any MSN	
✆	Pick up the handset.
✱21✱‹DNo› ✱‹MSN›#	Dial the sequence shown at left.
┈	Wait for the acknowledgement tone.
✆	Hang up the handset.

Call Forwarding Immediately for All MSNs	
✆	Pick up the handset.
✱21✱‹DNo›✱#	Dial the sequence shown at left.
┈	Wait for the acknowledgement tone.
✆	Hang up the handset.

Disable Call Forwarding Immediately for Your Outgoing Caller ID	
✆	Pick up the handset.
✱21✱#	Dial the sequence shown at left.
┈	Wait for the acknowledgement tone.
✆	Hang up the handset.

Disable Call Forwarding Immediately for Any MSN	
✆	Pick up the handset.
✱21✱✱‹MSN›#	Dial the sequence shown at left.
┈	Wait for the acknowledgement tone.
✆	Hang up the handset.

Disable Call Forwarding Immediately for All MSNs	
☎	Pick up the handset.
✱21✱✱#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
☎	Hang up the handset.

Call Forwarding When Busy

Incoming calls are forwarded to the specified number only if a call is already being conducted using the number dialed. You can define call diversion for the local outgoing call number. The local outgoing call number is the first number you assigned to an extension. You can also define call diversion for any other number, e.g. a telephone at another extension, or for all numbers. All settings can be disabled at any time.

Call Forwarding When Busy for Your Outgoing Caller ID	
☎	Pick up the handset.
✱67✱‹DNo›#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
☎	Hang up the handset.

Call Forwarding When Busy for Any MSN	
☎	Pick up the handset.
✱67✱‹DNo› ✱‹MSN›#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
☎	Hang up the handset.

Call Forwarding When Busy for All MSNs	
✆	Pick up the handset.
✱67✱‹DNo›✱#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
✆	Hang up the handset.

Disable Call Forwarding When Busy for Your Outgoing Caller ID	
✆	Pick up the handset.
✱67✱#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
✆	Hang up the handset.

Disable Call Forwarding When Busy for Any MSN	
✆	Pick up the handset.
✱67✱✱‹MSN›#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
✆	Hang up the handset.

Disable Call Forwarding When Busy for All MSNs	
✆	Pick up the handset.
✱67✱✱#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
✆	Hang up the handset.

Call Forwarding Delayed

Incoming calls are forwarded to the specified number if not answered at the number originally dialed within 20 seconds (about five rings). Call forwarding can be configured for your extension's outgoing caller ID (the first number assigned to an extension), for any number (for instance, a telephone at the other FRITZ!Box extension), or for all numbers. All settings can be disabled at any time.

Call Forwarding Delayed for Your Outgoing Caller ID	
☎	Pick up the handset.
✱61✱‹DNo›#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
☎	Hang up the handset.

Call Forwarding Delayed for Any MSN	
☎	Pick up the handset.
✱61✱‹DNo› ✱‹MSN›#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
☎	Hang up the handset.

Call Forwarding Delayed for All MSNs	
☎	Pick up the handset.
✱61✱‹DNo›✱#	Dial the sequence shown at left.
⋯	Wait for the acknowledgement tone.
☎	Hang up the handset.

Disable Call Forwarding Delayed for Your Outgoing Caller ID	
	Pick up the handset.
✪❻❶✪#	Dial the sequence shown at left.
	Wait for the acknowledgement tone.
	Hang up the handset.

Disable Call Forwarding Delayed for Any MSN	
	Pick up the handset.
✪❻❶✪✪‹MSN›#	Dial the sequence shown at left.
	Wait for the acknowledgement tone.
	Hang up the handset.

Disable Call Forwarding Delayed for All MSNs	
	Pick up the handset.
✪❻❶✪✪#	Dial the sequence shown at left.
	Wait for the acknowledgement tone.
	Hang up the handset.

Call Diversion

Incoming calls to the FRITZ!Box telephones can be diverted to a different extension or to an external number. In contrast to call diversion over FRITZ!Box, there is also call forwarding (call diversion via the central exchange). How to use call forwarding by phone is described in the section “Call Diversion on the ISDN Line” on page 65.

Do not activate both call forwarding and call diversion at the same time.

Call diversion allows you to forward calls to an external line or to another extension. This kind of diversion is organized inside FRITZ!Box so that diversions to another extension are free of charge. Calls are diverted to an external number over your ISDN line’s second B channel and are subject to normal transmission charges. If the FRITZ!Box is operated on an analog telephone line, incoming calls can only be diverted to a different extension or to numerical Internet numbers.

Note that only numerical Internet numbers can be entered for diversion to an Internet number.

You can specify the conditions under which an incoming call will be diverted over FRITZ!Box. You can select one of five different options. Different settings may be saved for each extension.

Call Diversion Immediately (Without Ringing)	
☎	Pick up the handset.
#41‹Ext.›* ‹DNo›/‹Ext.›*	Dial the sequence shown at left.
#901**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Call Diversion After the Third Ring	
✆	Pick up the handset.
❹❷‹Ext.›✱ ‹DNo›/‹Ext.›✱	Dial the sequence shown at left.
❾❶✱✱	Save your settings if desired by dialing the sequence shown at left.
✆	Hang up the handset.

Call Diversion When Busy	
✆	Pick up the handset.
❹❸‹Ext.›✱ ‹DNo›/‹Ext.›✱	Dial the sequence shown at left.
❾❶✱✱	Save your settings if desired by dialing the sequence shown at left.
✆	Hang up the handset.

Call Diversion After the Third Ring or When Busy	
✆	Pick up the handset.
❹❹‹Ext.›✱ ‹DNo›/‹Ext.›✱	Dial the sequence shown at left.
❾❶✱✱	Save your settings if desired by dialing the sequence shown at left.
✆	Hang up the handset.

Call Diversion Immediately by Ringing	
☎	Pick up the handset.
#45‹Ext.›* ‹DNo›/‹Ext.›*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Disable Call Diversion	
☎	Pick up the handset.
#40‹Ext.›**	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Call Waiting

Call waiting can be switched on or off for each extension. Some older terminal equipment connected to extensions may misinterpret the call waiting signal. This is especially true of fax machines and modems. If communication errors occur, you should disable call waiting for fax and modem extensions.

See section “Waiting Calls” on page 83 for information about how to accept a call while another connection is active.

When Call Waiting is enabled, modem and fax connections may be interrupted.

Enable Call Waiting	
☎	Pick up the handset.
#2 ‹Ext.› *0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Disable Call Waiting	
☎	Pick up the handset.
#2 ‹Ext.› *1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Caller ID Suppression for Outgoing Calls (CLIR)

The CLIR (Calling Line Identification Restriction) function prevents your telephone number being displayed on the other party's phone during outgoing calls.

The CLIR function is disabled in the factory settings. You have the option of enabling this function permanently and then disabling it again. CLIR can also be used for individual connections. When CLIR is permanently enabled, this setting is saved for the extension and always enabled for outgoing connections.

If you would like to conduct only certain calls with the Caller ID suppressed, prefix the number dialed with a keypad sequence. This enables CLIR only for the current connection.

Enable CLIR Permanently	
☎	Pick up the handset.
#51‹Ext.›*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Disable CLIR Permanently	
☎	Pick up the handset.
#51‹Ext.›*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

CLIR on a Case-by-Case Basis	
☎	Pick up the handset.
*31#	Dial the sequence shown at left. Now you hear the external dial tone.
⌨	Dial the number you want to call.

Displaying the Incoming Caller ID (CLIP)

The CLIP (Calling Line Identification Presentation) function makes the number of callers—external and internal—visible on your telephone display.

This feature is only effective if your telephone supports CLIP.

The CLIP function is enabled in the factory settings. This function can be permanently disabled and enabled again.

Enable Display of Incoming Caller ID (CLIP)	
☎	Pick up the handset.
#50‹Ext.›*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Disable Display of Incoming Caller ID (CLIP)	
☎	Pick up the handset.
#50‹Ext.›*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Connected ISDN Line Identification Restriction and Presentation (COLR/COLP)

By default, a caller's display always shows the Multiple Subscriber Number (MSN) of the extension she or he dialed. Yet if you take the call at another extension, the MSN of this extension will be displayed (see page 82). If you do not want the caller to know that the call has been picked up at another extension and thus wish this number to remain concealed, you have the option of suppressing transmission of the connected line's number. The caller's display will continue to show the number that was actually dialed.

Transmission of the connected line's number can be switched on and off for each extension individually. Transmission of the connected line's number is permanently enabled in the factory settings.

Enable Connected Line Identification Restriction (COLR) Permanently	
✆	Pick up the handset.
#53‹Ext.›*1*	Dial the sequence shown at left to disable transmission of the connected line's number.
#91**	Save your settings if desired by dialing the sequence shown at left.
✆	Hang up the handset.

Enable Connected Line Identification Presentation (COLP) Permanently	
✆	Pick up the handset.
#53‹Ext.›*0*	Dial the sequence shown at left to enable transmission of the connected line's number.
#91**	Save your settings if desired by dialing the sequence shown at left.
✆	Hang up the handset.

Disabling Automatic Outside Dialing

The offers the possibility of disabling automatic outside dialing. This means that you will receive an internal dialing tone when you lift the handset at the corresponding extension. This makes sense at any extension which is used to make many internal calls, for instance, between the extensions of the FRITZ!Box. When automatic outside dialing is disabled, for an external call the 0 must be dialed before the telephone number.

Disable Automatic Outside Dialing	
☎	Pick up the handset.
#1‹Ext.›*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Enable Automatic Outside Dialing	
☎	Pick up the handset.
#1‹Ext.›*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Call Rejection on Busy (Busy on Busy)

Calls for an extension can be rejected using the “Busy on Busy” feature. This means that the user receives a busy signal whenever the extension is busy.

Enable Busy on Busy	
☎	Pick up the handset.
#62‹Ext.›*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

Disable Busy on Busy	
☎	Pick up the handset.
#62‹Ext.›*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
☎	Hang up the handset.

10.2 Operation at the Telephone

This section describes how you can use the FRITZ!Box features via your telephone keypad.

Shortening the Dialing Procedure

The FRITZ!Box automatically recognizes when a number has been entered, but not until a few seconds after the final digits are entered.

You have the possibility of shortening the dialing procedure by closing your entry with the # key.

Shorten the Dialing Procedure	
‹number› #	indicates that a number has been dialed to shorten the dialing procedure

Selecting the Outgoing Number and the Type of Connection

For outgoing connections you can specify the kind of connection to be used for the next dialing procedure. For this entry you can use settings already made, or circumvent the settings currently configured. In this case the dialing rules are suspended for the given dialing procedure.

By entering precisely which Internet telephony account should be used it is possible to have the dialing procedure conducted via a certain Internet number, even though this number was never previously configured for the extension used.

Select the Outgoing Number and the Type of Connection	
✱❶❶❶# ‹Phone number›	dials up this connection using the fixed-line network
✱❶❷# ‹Phone number›	dials up this connection using the first Internet phone number
✱❶❷‹P›#	establishes an Internet telephony connection via the specified Internet phone number. For ‹P› enter the position of the Internet number in the “List of Internet Numbers”.

Making Internal Calls

All calls conducted between telephones connected to the FRITZ!Box, be they analog or ISDN/DECT phones, are internal telephone calls. These calls are free of charge.

Dial Internal Calls with Automatic Outside Dialing	
☎	Pick up the handset. You can hear the external dial tone immediately, since the extension is set for automatic outside dialing.
✱✱‹Ext.›	If you would like to make an internal call to one of the extensions, dial ✱✱, followed by the number of the extension, for instance ❶ or ❷.
✱✱5❶	If you would like to call all ISDN terminal devices for which no number has been configured, then dial ✱✱5❶.
✱✱‹ISDN ID›	If you would like to call an ISDN terminal device for which you have defined an internal phone number, dial ✱✱ followed by the internal number of the device (for instance, 5❶).
✱✱5‹MSN›	If you would like to call an ISDN device that does not have an internal phone number, dial ✱✱5, followed by the MSN that was saved in the ISDN terminal device.

Dial Internal Calls without Automatic Outside Dialing	
☎	Pick up the handset. You hear the internal dial tone.
‹Ext.›	Dial the desired extension number, for instance ❶ or ❷.
5❶	If you would like to call all ISDN terminal devices for which no phone number has been configured, dial 5❶.
‹ISDN ID›	If you would like to call an ISDN terminal device for which you defined an internal phone number, dial the internal phone number of the device (for instance, 5❶).
5‹MSN›	If you would like to call an ISDN terminal device that does not have an internal phone number, dial 5, followed by the MSN that was saved in the ISDN terminal device.

Group Call

Place a group call to call all other extensions at the same time. Your call is connected with whichever extension answers first.

Group Call	
✆	Pick up the handset.
✱✱9	Dial the keypad sequences lshown at left to call all free extensions.

Picking up a Call from the Answering Machine

Use this function to pick up incoming calls on your telephone that already have been taken by the answering machine.

Pick up a Call	
✆	Pick up the handset.
✱09	Dial the sequence shown at left.
✆	The call is now connected to your extension and you can talk to the caller.

Waiting Calls

When the “Call Waiting” feature is enabled and you are conducting a call, you will be notified as soon as an external call arrives on your your line. This call will be signaled by an acoustic signal in the handset. You can accept the connection with the new caller within 30 seconds. If you ignore the signal, the waiting call is rejected after 30 seconds.

For instructions on how to turn the Call Waiting function on and off, see the section “Call Waiting” on page 74.

Accept or Reject Waiting Calls	
R2	To accept a waiting call, dial the sequence shown at left. Your original call is now on hold.
R1	To return to your original connection, dial the sequence shown at left. You can also accept the waiting call by hanging up your existing connection, i.e., by hanging up the handset. In this case the phone rings as soon as you have hung up. Pick up the handset again to accept the waiting call.
R0	To reject a waiting call, dial the sequence shown at left.

Call Back on Busy (CCBS) on the ISDN Line

When you dial a number and it is busy, you can enable the “Call Back on Busy” feature. As soon as the line is free, your telephone rings for 20 seconds, as it would for an external call. When you pick up your handset, the number of desired party will be dialed automatically.

“Call Back on Busy” can be used for both external and internal connections.

A maximum of five call-back requests can be enabled for each extension at any given time.

Call-back on Busy (CCBS)	
	You have just dialed a number and now you hear the busy signal.
5	If the call is not answered, within twenty seconds, dial either the number 5
	or
R*37#	the sequence shown at left.
	Wait for the acknowledgement tone.
	Hang up the handset.
	As soon as the subscriber you dialed hangs up, your telephone will ring.
	Pick up the handset. The subscriber's number is dialed again automatically.

Call Back on No Response (CCNR) on the ISDN Line

The "Call Back on No Response" function can be used when you dial a number and the party does not respond. Once the party can be reached again and conducts a call from her or his phone, this function recognizes when this conversation is ended. Your phone then rings. When you pick up your handset, the number of the desired party is automatically dialed again.

"Call Back on No Response" can be used both for external and internal connections.

This command can be activated five times for each line.

Enable Call Back on No Response (CCNR)	
☎	You have just dialed a number and hear a ring tone.
❺	If the call is not answered, within twenty seconds, dial either the number ❺
	or
®✱❸❼#	the sequence shown at left.
☎	Wait for the acknowledgement tone.
☎	Hang up the handset. As soon as the party you dialed completes the conversation being conducted from her or his phone, your phone rings.
☎	Pick up the handset. The number of the remote party is dialed again automatically.

Callback requests can also be deleted manually, with the oldest callback request being deleted first.

Delete Callback Requests Manually	
☎	Pick up the handset.
#❸❼#	Dial the sequence shown at left.
☎	Hang up the handset.

Alternating Between Calls

Whenever you have one active connection and one caller on hold, you can switch from one call to the other as often as you want using the Hold button.

Alternate Between Calls	
Call 1 ✆	You are talking to Caller 1.
®R	Press the Hold button. Caller 1 is now on hold.
▦	To establish a second call, simply dial ✱✱ plus the desired extension number for an internal call, or the desired external number.
Call 2 ✆	If the call is answered, you can consult on this line. The original caller is still on hold.
®R❷	To switch back from Caller 2 to Caller 1, dial the sequence shown at left.
Call 1 ✆	Caller 1 is now active again and Caller 2 is on hold.
®R❷	To switch back again from Caller 2 to Caller 1, dial the same sequence. In this way you can alternate between the two connections.

End Hold	
⏻	The caller on hold hangs up. You can continue talking on the active connection.
®R❶	You end the active connection by dialing the sequence shown at left. The call that was on hold is now active again, and there is no call left on hold.
⏻ 🔊 Call ✆	You can also return to the call on hold by hanging up the handset: this ends the currently active connection. In this case the phone rings as soon as you hang up. Pick up the handset again to return to the last call that was on hold.

Three-Party Conference Call

FRITZ!Box allows you to hold telephone conferences with two other people at once. Two external and one internal party, or two internal and one external party can conduct a conference call with each other.

Hold a Three-Party Conference Call	
	Pick up the handset.
	Dial the external number of the first party. Talk.
R	Press the Hold button.
	To establish a second call, simply dial ✱✱ plus the desired extension number for an internal call, or the desired external number. You can now conduct a second conversation while your first call is on hold.
R3	Dial the sequence shown at left to begin a three-party conference call.
	Now all three participants can confer together. If either of the other two parties hangs up, your connection with the remaining participant remains active.
	You can end the three-party call by hanging up the handset.
R2	You can also switch from the three-party call back to the original two-party connection. Dial the sequence shown at left. This ends the three-party conference. The connection that was active last before you initiated the three-party conference is now active again. The other call is on hold. You can alternate between the two connections by dialing the same sequence again.

Consultation / Hold

The Consultation/Hold feature allows you to place an existing call on hold. You then may consult with someone else at your workplace or dial a second call. The party on hold does not hear the second conversation. Once you have finished the consultation, you can return to the original connection.

Consultation / Hold	
Call 1 ✆	You are talking to Caller 1.
R	Press the Hold button. Caller 1 is now on hold and you can consult someone else.
⌨	To establish a second call, simply dial ✱✱ plus the desired extension number for an internal call, or the desired external number.
Call 2 ✆	If the call is answered, you can consult on this line. The original caller is still on hold.
R	If the number you dialed is busy or the call is not answered, press the Hold button again to return to Caller 1.
R1	To switch back to Calller 1 after talking on the second connection, dial the sequence shown at left. Caller 1 is now active again.

If you return to Caller 1 by pressing the Hold button, the connection to Caller 2 is not cleared down until Caller 2 hangs up.

End Consultation	
Call 1 ✆	You can also return to Caller 1 by hanging up the handset: this ends the connection to Caller 2. In this case, your phone rings as soon as you hang up. Pick up the handset to return to Caller 1 again.
☎	Hang up the handset to end the connection.

Transferring Calls

The “Call Transfer” function allows you to transfer a connection from one of FRITZ!Box's extension to another.

Transfer Calls	
Call 1 ✆	You are talking to Caller 1.
R	Press the Hold button. Caller 1 is now on hold.
✱✱‹Ext.›	To establish a connection to Caller 2, dial the star key twice and then her or his extension number.
Call 2 ✆	You can now talk with the other Caller 2.
☎	To transfer the Caller 1 to Caller 2, simply hang up the handset.

Explicit Call Transfer (ECT)

Use the “Explicit Call Transfer” function to connect two external parties with each other while one connection is active and the other is on hold. Then you can end your own connection while the other two parties continue their conversation.

Explicit Transfer of One Active and One Held Connection	
☎	Pick up the handset.
⌨	Dial the external number of the first party. Talk.
R	Press the Hold button.
⌨	Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold.
	To clear your connection while allowing the external parties to continue the call, connect the parties with each other.
R4	Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection.
☎	Hang up the handset.

Explicit Call Transfer from a Three-party Conference Call	
☎	Pick up the handset.
⌨	Dial the external number of the first party. Talk.
®	Press the Hold button.
⌨	Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold.
®3	Dial the sequence shown at left to begin a three-party conference call.
⚇	Now all three participants can confer together. If either of the other two parties hangs up, your connection with the remaining participant remains active.
	To clear your connections while allowing the external parties to continue the call, connect the parties with each other.
®2	You can also switch from the three-party call back to the original two-party connection. Dial the sequence shown at left. This ends the three-party conference. The connection that was active last before you initiated the three-party conference is now active again. The second external call is on hold. You can alternate between the two connections by dialing the same sequence again.
®4	Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection.
☎	Hang up the handset.

One-time Explicit Transfer on the ISDN Line

Explicit Call Transfer (ECT) is an ISDN feature that must be enabled by your ISDN provider and thus usually is subject to extra charges. If ECT has not been enabled on your line, you can program the telephone system to initiate a one-time explicit call transfer before connecting to two parties. When you end the connection, the other two parties will be connected to each other.

One-time Explicit Transfer	
↑	Pick up the handset.
*3#2#	Dial the sequence shown at left. You hear the external dial tone.
☎	Dial the external number of the first party. Talk.
R	Press the Hold button.
☎	Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold.
	To clear your connections while allowing the external parties to continue the call, connect the parties with each other.
R4	Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection.
↓	Hang up the handset.

With this type of external transfer, both parties are connected to each other over your PBX. This means that both B channels on your ISDN line remain busy with this connection as long as the parties are connected to each other.

Suspending/Resuming a Call on the ISDN Line

The “Suspend/Resume” feature, also known technically as Terminal Portability, allows you to suspend an existing connection and resume it at another point on the S_0 bus. The connection can be resumed at a different ISDN terminal device (such as an ISDN telephone) that is connected to your BRI line along with the FRITZ!Box.

You will hear an acknowledgement tone to indicate that the call has been successfully suspended. If you hear the failure tone, this may indicate that you made a mistake, or that the “Suspend/Resume” feature is not enabled on your line. It is also possible that the parked-call ID you chose is already in use.

You can resume the suspended call using another ISDN device on the S_0 bus.

Suspend/Resume a Call	
✆	You are talking to a caller.
Ⓡ	Press the Hold button. Caller 1 is now suspended.
✱1‹PC›✱	Dial the sequence shown at left. Type in a code for the suspended call as ‹PC› (parked-call ID). The code can be any number between 0 and 99. You will need to enter this code again when you resume the call.
⋯ ✆	After the acknowledgement tone, the connection is suspended. You can hang up the handset. The call remains suspended at the ISDN provider’s local switch for two minutes.

Call Tracing (MCID) on the ISDN Line

You can use this function during a call or after the caller hangs up. For more information about this feature, contact your ISDN provider.

Call Tracing (MCID)	
R✱39#	Dial the sequence shown at left.

Room Monitoring (Baby Monitor)

The following key sequence enables the function for monitoring the sound level in a room. First enter the volume level (a value between 1 and 8). Enter a telephone number. Do not hang up the handset! When the volume in the room reaches the specified level, the number you entered will be dialed. When the telephone rings and you pick up the handset, you will be connected with the telephone on which you enabled the room monitoring function.

When using this feature, it is advisable to activate the speaker phone function.

Enable Room Monitoring	
↑	Pick up the handset or activate the speaker phone function of your telephone.
✱4 ‹level› ✱ ‹number› #	Dial the sequence shown at left. For ‹level›, enter a number between 1 (the most sensitive sound level) and 8. For ‹number›, enter the number to be called. This may be the number of another internal extension, a 9 for an internal group call, or any external number desired.
⋯	Wait for the acknowledgement tone. The baby monitoring phone function is now enabled.
	Do **not** hang up the handset!

Dial the number of the extension to listen in at an extension with room monitoring activated.

After initiating a room monitoring phone call, the PBX cannot generate a new call until at least one minute has lapsed.

You can disable the function by simply hanging up the handset of the telephone at which you enabled it.

Using Keypad Messages

The “keypad” function allows you to control services and features on the telephone line (ISDN/analog) by entering characters and strings on the telephone keypad.

These keyboard entries are called keypad messages. Ask your telephone carrier for the specific keypad messages to access ISDN features.

Enter Keypad Messages on an Extension with Automatic Outside Dialing	
☎	Pick up the handset.
✱#‹Seq›	Dial the sequence shown at left. ‹Seq› stands for the keypad sequence you received from your telephone carrier.

Enter a Keypad Sequence on an Extension without Automatic Outside Dialing	
☎	Pick up the handset.
0✱#‹Seq›	Dial the sequence shown at left. ‹Seq› stands for the keypad sequence you received from your telephone carrier.

11 Troubleshooting
Help for Errors

This chapter provides concrete assistance if you are not able to open the user interface of your FRITZ!Box, if you are having problems with the WLAN connection, or if you want to change the IP settings on your computer.

11.1 Errors Opening the User Interface

If an error message is returned when you open the user interface, this can have various causes. Check the possible causes and attempt to resolve the error.

Restarting the FRITZ!Box

The user interface cannot be opened or does not react.

Possible Cause

Inconsistencies within the FRITZ!Box.

Remedy

1. Restart the FRITZ!Box.

   Remove the power cable from the socket.

2. Wait about five seconds before reconnecting to the power supply.

3. Try again to open the FRITZ!Box user interface by entering fritz.box in the address field.

Checking the Cable Connections

The user interface of the FRITZ!Box does not appear in the window of your web browser.

Possible Cause

The cable connections are not secure.

Remedy

Make sure that all cable connections are plugged in securely.

Check the Name Resolution

The user interface of the FRITZ!Box cannot be opened by entering fritz.box.

Possible Cause

The name resolution of the FRITZ!Box does not work.

Remedy

1. In the web browser, enter the following IP address in place of fritz.box:

   192.168.178.1

2. If the user interface cannot be reached via this address, check the settings configured for your network adapter as described in section “IP Settings” from page 106.

Checking the IP Address

The user interface of the FRITZ!Box cannot be reached at the address fritz.box nor at 192.168.178.1.

Possible Cause

The IP address set on the connected computer is inapplicable.

Remedy

Set the network adapter used to DHCP so that the IP address can be obtained via the DHCP server of the FRITZ!Box. Adjust the settings to those described in the section “IP Settings” from page 106.

Disabling Dial-Up Connections

The user interface is not opened; a window for a dial-up connection appears instead.

Possible Cause

The browser must use the network connection between the computer and FRITZ!Box when the user interface is opened. For this the automatic establishment of a Dial-Up Networking connection must be disabled.

Remedy

You can disable the automatic attempt to establish a Dial-Up Networking connection. The following example explains how to check the settings of Internet Explorer 6:

1. Select the “Connections” settings page under “Tools / Internet Options...”.
2. In the “Dial-up and Virtual Private Network settings” section, enable the option “Never dial a connection”.
3. As a final step, click “OK”.

Disabling Online Operation

The user interface does not appear in the window of your web browser.

Possible Cause

The web browser is set for offline operation.

Remedy

Configure the web browser for online operation. Using the example of Internet Explorer 6:

1. Open the “File” menu.
2. If a checkmark is displayed in front of “Work Offline”, click this line.

The checkmark will be removed and Internet Explorer will switch to online operation.

Checking the Proxy Settings

The user interface does not appear in the window of your web browser.

Possible Cause

The proxy settings of the web browser prevent the user interface from being opened.

Remedy

Enter the DNS name and the IP address of the FRITZ!Box as an exception in the proxy settings of the web browser.

1. Select the “Connections” settings page under “Tools / Internet Options...”.
2. Click the “LAN Settings...” button in the “Local Area Network (LAN) settings” area, and in the next window, click the “Advanced...” button in the “Proxy server” area.

3. Under “Exceptions” enter: “fritz.box; 192.168.178.1; 169.254.1.1” and click “OK”.

Checking the CGI Settings

The user interface does not appear in the window of your web browser.

Possible Cause

The execution of CGI scripts is disabled in the web browser.

Remedy

Configure the web browser so that the execution of scripts is allowed in the user interface. Using the example of the Internet Explorer 6:

1. Select “Tools / Internet Options... / Security”.
2. If the “Default Level” button is not available for selection, the “Medium” security level is already configured, which means that CGI scripts can be executed in the Internet browser.
3. Proceed as follows if the “Default Level” button is available for selection:
4. Select the “Local Intranet” icon and click the “Sites...” button.
5. In the next window, click the “Advanced...” button and enter in the “Add this Web site to the zone:” field:

   fritz.box
6. Disable the option “Require server verification (https:) for all sites in this zone”.

Checking the Security Software

The user interface cannot be displayed in the web browser.

Possible Cause

Security software is blocking access to the user interface.

Remedy

Security software like firewalls can prevent access to the user interface of the FRITZ!Box. Configure exceptions for the FRITZ!Box in all of the enabled security software.

If you would like to exit security software to test access to the FRITZ!Box, remove the DSL/VDSL cable first! After testing, first start the security software before reinserting the DSL/VDSL cable and connecting to the Internet.

Opening the User Interface of the FRITZ!Box

The FRITZ!Box is equipped with a fixed IP address that cannot be changed. FRITZ!Box always can be reached at this IP address. This fixed IP address is:

Fixed IP Address	169.254.1.1

Proceed as follows to open the FRITZ!Box user interface using this IP address:

1. Connect the FRITZ!Box to the computer using the network cable (yellow). For more information, see the section “Connecting Computer(s) to the LAN Port” from page 18.
2. Make sure that the computer obtains its IP address automatically. You can check this setting in the computer’s IP settings (see section “IP Settings” from page 106).
3. Restart your computer.

4. Start your Internet browser and enter FRITZ!Box's fixed IP address:

   169.254.1.1

The FRITZ!Box user interface opens.

Once you have reached the FRITZ!Box user interface again, you should check the FRITZ!Box settings and correct them if necessary.

11.2 The WLAN Adapter Cannot Find FRITZ!Box

If the radio network “FRITZ!Box Fon WLAN 7570 vDSL” is not found by the WLAN adapter of a computer, work through the following steps to find the source of the error and resolve it.

Enabling the WLAN Adapter

The WLAN adapter cannot find a wireless network.

Possible Cause

The WLAN adapter is not ready for operation.

Remedy

Make sure that the WLAN adapter is ready for operation. Some of the WLAN adapters installed in notebooks must be activated by flipping a switch on the notebook.

For questions on the WLAN adapter of your computer, please contact the manufacturer.

Enabling WLAN

The wireless network of the FRITZ!Box is not found by the WLAN adapter.

Possible Cause

WLAN is not enabled in the FRITZ!Box. If the “WLAN” LED on the FRITZ!Box is not lit up or is flashing, this means that WLAN is not enabled.

Remedy

Press the WLAN button on the FRITZ!Box. The “WLAN” LED begins flashing and then remains lit. This means that the WLAN function is enabled.

Announcing the Name of the Radio Network

The WLAN Adapter cannot find the wireless network of the FRITZ!Box.

Possible Cause

The name of the wireless network of the FRITZ!Box is concealed.

Remedy

Enable the setting “Announce name of the radio network (SSID)” in the WLAN settings of the FRITZ!Box.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computer(s) to the LAN Port” on page 18.
2. Start a web browser.
3. Enter fritz.box in the address field.
4. Select the “Settings” menu.
5. Select the “Advanced Settings / WLAN / Radio Settings” menu and enable the setting “Announce name of the radio network (SSID)”.

6. Click the “Apply” button.
7. Remove the network cable and try again to establish a connection via WLAN.

11.3 WLAN Connection Is Not Established

Comparing the Security Settings for WLAN

Make sure that the WLAN security settings registered in the FRITZ!Box agree with the security settings of the WLAN adapter.

Here is how to view the WLAN security settings of the FRITZ!Box and print them out.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computer(s) to the LAN Port” from page 18.
2. Start a web browser.
3. Enter fritz.box in the address field.
4. Select the “Settings” menu.
5. Select the “Advanced Settings / WLAN / Security” menu.
6. Click the “Apply” button.

   A window is displayed with the WLAN security settings. Print out this page by clicking the “Print Page” button at the upper left of the page.
7. Remove the network cable and check the configuration of the WLAN adapter in the printout. Try again to establish a connection.

Testing the WLAN Connection Without Security Settings

Disable the WLAN security settings to test whether a WLAN connection between the FRITZ!Box and the WLAN adapter is possible at all.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computer(s) to the LAN Port” from page 18.
2. Open the user interface in a web browser. Proceed as described in the section “Opening the User Interface” on page 29.
3. In the “Advanced Settings / WLAN / Security” menu and select “Enable Access without Encryption”. As a final step, click “Apply”.
4. Remove the network cable and try again to establish a connection.

This non-secured condition should be used only for testing, to find out whether a WLAN connection is possible at all.

If the attempt to connect to the WLAN using the non-encrypted connection is not successful either, check the installation of the WLAN adapter and contact the manufacturer of the WLAN adapter if necessary.

Enable WLAN encryption again after completing the tests. Follow the steps listed above and then enable the kind of encryption that was previously configured.

Installing the Patch for WPA2 with Microsoft WLAN Service

The WLAN connection to FRITZ!Box cannot be established using the Microsoft WLAN Service (WZC = Windows Zero Configuration) in Windows XP with Service Pack 2.

Possible Cause

The required Microsoft patch for WPA2 (IEEE 802.11i) may not be not installed.

Remedy

Support for WPA2 in Microsoft WLAN service was not available until the current patch for Microsoft Windows XP Service Pack 2. Install the current patch from Microsoft:

support.microsoft.com/kb/917021

Alternatively, you can install Service Pack 3 instead.

Ruling Out Interference Caused by Other Wireless Networks

If there are other devices in the immediate vicinity of your FRITZ!Box that use the 2.4-GHz band, simultaneous use of frequencies can result in mutual interference (for example, fluctuations or interrupted connections). Disruptions can also be caused by other WLAN access points, or by Bluetooth devices, garage door openers or wireless AV bridges. In this case, please test a different radio channel for your FRITZ!Box.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computer(s) to the LAN Port” from page 18.
2. Start a web browser.
3. Enter fritz.box in the address field.
4. Select the “Settings” menu.
5. Open the “Advanced Settings / WLAN / Radio Settings” menu.

6. Select a different radio channel from the “Select radio channel” list.
7. Click the “Apply” button.
8. Remove the network cable and check whether interference continues to occur.

11.4 IP Settings

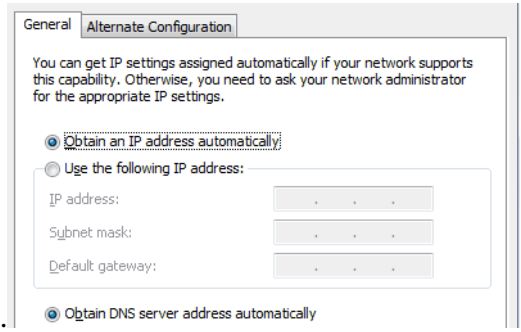
The FRITZ!Box is equipped with its own DHCP server. This means that the connected computers obtain their IP addresses from the FRITZ!Box. The connected computers must be configured such that they can receive their IP addresses automatically. The steps for checking and adjusting this option differ among the operating systems. See the relevant section for your operating system.

If FRITZ!Box is operated in a network, no other DHCP server may be activated in this network. If you need to operate a DHCP server, please disable the DHCP feature in the “Advanced System Settings”.

Obtaining an IP Address Automatically in Windows Vista

1. Click the “Start” button in the task bar and select “Control Panel / Network and Sharing Center”.
2. From the “Tasks”, select “Manage network connections”.
3. In the “LAN or High-Speed Internet” area, select the LAN connection between your computer and the FRITZ!Box. Click the right mouse button and select “Properties”.
4. If the “User Account Control” window is displayed, click “Continue” in this window.
5. Under “This connection uses the following items”, select the “Internet Protocol Version 4 (TCP/IPv4)” entry and click “Properties”.

6. On the “General” tab, enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.


General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically

Properties of the Internet protocol (TCP/IP)

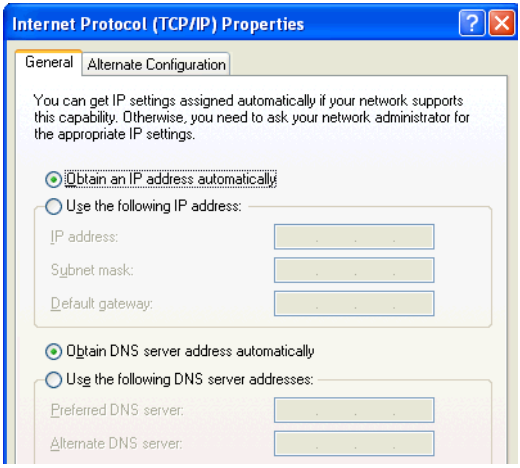
7. Confirm your selection by clicking “OK”.

   If necessary, repeat steps 5 through 7 for the “Internet Protocol Version 6 (TCP/IPv6)” as well.

The computer now receives an IP address from the FRITZ!Box.

Obtaining an IP Address Automatically in Windows XP

1. Go to “start / Control Panel / Network and Internet Connections / Network Connections” and double-click on the LAN connection icon of the network adapter connected to FRITZ!Box.
2. Click the “Properties” button.
3. Select “Internet Protocol (TCP/IP)” in the list of items used in this network connection and click “Properties”.
4. Enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.


Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:

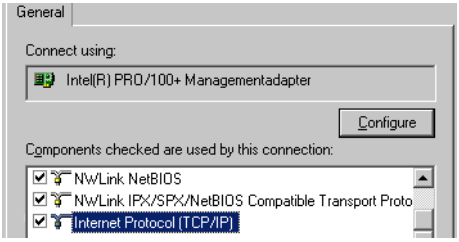
Properties of the Internet protocol (TCP/IP)

5. Confirm your selection by clicking “OK”.

The computer now receives an IP address from the FRITZ!Box.

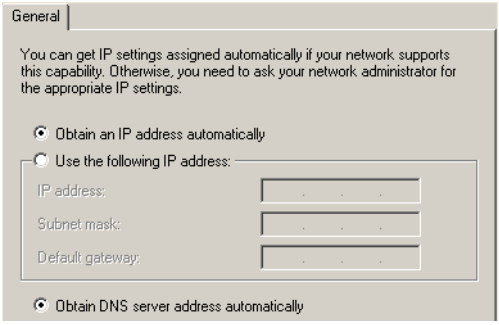
Obtaining an IP Address Automatically in Windows 2000

1. Select “Start / Settings / Control Panel / Network and Dial-up Connections”.
2. Double-click to select the LAN connection with the network adapter bound to FRITZ!Box.
3. Click the “Properties” button.
4. Double-click to select “Internet Protocol (TCP/IP)” in the list of network components.



Properties of the LAN connection of a network adapter

5. Enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.


General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically

Properties of the Internet protocol (TCP/IP)

6. Confirm your selection by clicking “OK”.

The computer now receives an IP address from the FRITZ!Box.

Obtaining an IP Address Automatically in Mac OS X

1. Select the “System Preferences” in the Apple menu.
2. In the “System Preferences” window, click the “Network” icon.
3. In the “Network” window, select the “Built-in Ethernet” entry from the “Show:” drop-down menu.
4. Switch to the “TCP/IP” settings page and select the “Using DHCP:” option from the “Configure IPv4” drop-down menu.
5. Click “Apply Now”.

The computer now receives an IP address from the FRITZ!Box.

Obtaining an IP Address Automatically in Linux

For comprehensive information and tips on the topic of network configuration in Linux, see, for example:

http://www.tldp.org/HOWTO/NET3-4-HOWTO-5.html

12 Uninstallation
Removing Software and Program Entries

This chapter describes how to:

- disconnect the FRITZ!Box from the computer
- uninstall the FRITZ!DSL software package
- remove the printer port
- remove the FRITZ!Box program group.

12.1 Disconnecting the FRITZ!Box from the Computer

LAN Port

If the computer is connected to one of the LAN ports on the FRITZ!Box, simply remove the network cable.

If the computer is connected to the FRITZ!Box via a network hub or switch, remove the network cable between the computer and the network hub or switch.

WLAN

If the computer is connected to the FRITZ!Box wirelessly via WLAN, deactivate the WLAN connection to FRITZ!Box in the WLAN adapter of the computer.

12.2 Removing the FRITZ!DSL Software

You can remove the FRITZ!DSL software package using the Control Panel of the Windows operating system.

Removing FRITZ!DSL in Windows Vista

1. Open “Start / Settings / Control Panel / Programs and Functions”.
2. From the list displayed, select the entry “AVM FRITZ!DSL”.
3. Click the “Uninstall/Change” button.
4. Confirm the next query by clicking “Continue”.

This concludes the removal of FRITZ!DSL.

Removing FRITZ!DSL in Windows XP

1. Open “start / Control Panel / Add or Remove Programs”. Make sure that the “Change or Remove Programs” button is selected in the column at left.
2. Select the “AVM FRITZ!DSL” entry from the list of “Currently installed programs”.
3. Click the “Change/Remove” button.

This concludes the removal of FRITZ!DSL.

Removing FRITZ!DSL in Windows 2000

1. Open “Start / Settings / Control Panel / Add/Remove Programs”. Make sure that the “Change or Remove Programs” button is selected in the column at left.
2. Select the “AVM FRITZ!DSL” entry from the list of “Currently installed programs”.
3. Click the “Change/Remove” button.

This concludes the removal of FRITZ!DSL.

12.3 Removing the Printer Port

The AVM FRITZ!Box printer port is removed using the Control Panel of the Windows operating system.

Removing the Printer Port in Windows Vista

1. Open “Start / Settings / Control Panel / Programs and Functions”.
2. Select the “AVM FRITZ!Box Printer Port” entry from the list.
3. Click the “Uninstall/Change” button.
4. Confirm the next query by clicking “Continue”.

This concludes the uninstallation of the printer port.

Removing the Printer Port in Windows XP

1. Open “start / Control Panel / Add or Remove Programs”. Make sure that the “Change or Remove Programs” button is selected in the left-hand column.
2. Select the “AVM FRITZ!Box Printer Port” entry from the list of “Currently installed programs”.
3. Click the “Change/Remove” button.

This concludes the uninstallation of the printer port.

Removing the Printer Port in Windows 2000

1. Open “Start / Settings / Control Panel / Add/Remove Programs”. Make sure that the “Change or Remove Programs” button is selected in the left-hand column.
2. Select the “AVM FRITZ!Box Printer Port” entry from the list of “Currently installed programs”.
3. Click the “Change/Remove” button.

This concludes the uninstallation of the printer port.

12.4 Removing the Program Group

Remove the “FRITZ!Box” program group using the Control Panel of the Windows operating system.

Removing the Program Group in Windows Vista

1. Open “Start / Settings / Control Panel / Programs and Functions”.
2. Select the “AVM FRITZ!Box Documentation” entry from the list.
3. Click the “Uninstall/Change” button.
4. Confirm the next query by clicking “Continue”.

This concludes the uninstallation of the program group.

Removing the Program Group in Windows XP

1. Open “start / Control Panel / Add or Remove Programs”. Make sure that the “Change or Remove Programs” button is selected in the left-hand column.
2. Select the “AVM FRITZ!Box Documentation” entry from the list of “Currently installed programs”.
3. Click the “Change/Remove” button.

This concludes the uninstallation of the program group.

Removing the Program Group in Windows 2000

1. Open “Start / Settings / Control Panel / Add/Remove Programs”. Make sure that the “Change or Remove Programs” button is selected in the left-hand column.
2. Select the “AVM FRITZ!Box Documentation” entry from the list of “Currently installed programs”.
3. Click the “Change/Remove” button.

This concludes the uninstallation of the program group.

13 Directions for Operation
Symbols, Keys and LEDs

The following sections present important information and tips for operation of the FRITZ!Box Fon WLAN 7570 vDSL.

13.1 Symbols and Highlighting

This symbol indicates useful hints to assist you in working with the FRITZ!Box.

This symbol indicates important instructions that must be observed to avoid malfunctions.

The table below explains the highlighting used in this manual.

Highlighting	Function	Examples
Quotation marks	Keys	“F1” key
	Buttons	“Help”
	Settings pages	“Advanced”
	Menus	“Edit/Paste”
	Commands	“Copy”
	File paths	“C:/My Documents”
	File names	“Documentation”
Underlined text	Text input	www.avm.de/en fritz.box
Pointed brackets	Joker	‹MSN›
Bold	Emphasis	Do **not** click the button...

13.2 The Telephone Keypad

⓪ through ⑨	Numeric keys
✱	Asterisk key
Ⓡ	Hold or Flash key
#	Pound key

13.3 Instructions for Operation at the Telephone

	Dial a number.
	Pick up the handset.
	Hang up the handset.
	Talk
	Three-party conference call
	Wait for the acknowledgement tone.
	You hear the ring tone.
‹Ext.›	Enter an extension number (Ext.). In the place of the abbreviation ‹Ext.› used here, enter the number ❶, ❷, or a higher number, corresponding to the extension you would like to configure.
‹MSN›	Enter an ISDN number (MSN). In place of the abbreviation ‹MSN› used here, enter the complete MSN desired, without any dialing prefix.
‹DNo›	Enter an external telephone number (destination number). In the place of the abbreviation ‹DNo›, enter the complete number of the external line.
‹DNo./Ext.›	Enter the external telephone number (destination number) or extension number (Ext.) to which your calls are to be diverted.

13.4 LEDs

Twelve LEDs are built into the top of the FRITZ!Box Fon WLAN 7570 vDSL, which flash or light up to display various connection statuses.

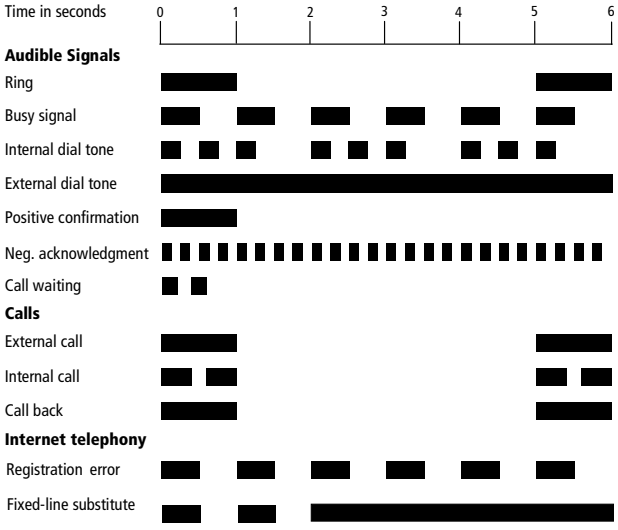
LED	Status	Meaning
INFO	on	◆ a telephone connection between two Internet telephony subscribers is active; the call is free of charge (this function must be supported by your Internet telephony provider) ◆ signals an event that can be configured freely by the user ◆ the Stick & Surf procedure has been concluded
	flashes	◆ the value specified for the online meter has been reached ◆ signals an event that can be configured freely by the user ◆ Stick & Surf procedure in progress ◆ logon procedure for a DECT handset in progress
LAN 1 - LAN 4	on	a network cable is plugged in and the connection to the computer is working
	flashes	data are transmitted over the LAN connection
WLAN	on	the WLAN function is enabled
	flashes	the WLAN function is being enabled or disabled
Update	on	firmware is being updated
DECT	on	the DECT function is enabled
	flashes	logon procedure for a DECT handset in progress
Online	on	a VoIP connection is configured
Power/DSL	on	◆ FRITZ!Box on standby ◆ the device has electrical power and the DSL/VDSL line is ready for operation
	flashes	◆ the device has electrical power ◆ the connection to DSL/VDSL is being established or has been interrupted
Internet	on	a telephone connection to the Internet is active

LED	Status	Meaning
	flashes	there are messages in your mailbox (this function must be supported by your telephony carrier)
Fixed Line	on	a telephone connection via the telephone line (ISDN/analog) is active
	flashes	there are messages in your mailbox (this function must be supported by your telephony carrier)

Here you can define what additional information should be displayed on the “INFO” LED. For details, see the ”Settings / Advanced Settings / System / “INFO” Display” section of the FRITZ!Box Fon WLAN 7570 vDSL user interface.

13.5 Handset and Ring Patterns

The following diagram illustrates the duration and intervals of the various handset and ring signals on the connected telephones.



Handset and ring patterns on FRITZ!Box Fon WLAN 7570 vDSL

II PRODUCT DETAILS AND USEFUL INFORMATION

1 Product Details
FRITZ!Box Fon WLAN 7570 vDSL

This chapter provides you with product details on FRITZ!Box Fon WLAN 7570 vDSL. You receive information on the cables and buttons, technical data and further details.

1.1 Cables and Buttons

See the information in the following section on the individual cables and switches on the FRITZ!Box Fon WLAN 7570 vDSL.

Telephone Cable

The DSL/VDSL cable is a special combined cable developed by AVM to connect the FRITZ!Box Fon WLAN 7570 vDSL to the DSL/VDSL splitter and the ISDN NT or analog telephone line.

If you need a longer cable, you can extend one or multiple ends of the combined cable using RJ45 double couplings. Which ends of the cable you extend depends on the spatial conditions at your location.

You will need the following components to extend the length of your cable:

- 1 standard network cable
- 1 standard RJ45 CAT5 double coupling

Both components are available from specialized vendors.

AVM recommends that the standard network cable be extended by no more than 10 meters.

Remember that the quality of the line may be decrease as the distance from the central switching station increases.

Network Cable

Additional network cable is required if you would like to use all of the FRITZ!Box Fon WLAN 7570 vDSL network ports.

The FRITZ!Box Fon WLAN 7570 vDSL network cable (yellow) is a standard Ethernet cable. If you need a replacement cable, a longer cable or an extension, use a standard STP-type (Shielded Twisted Pair, 1:1) CAT5 Ethernet cable. To extend the cable you will also need a standard CAT45 double coupling link to RJ5. You can use either straight cable or cross-link cable. All components are available from specialized vendors.

AVM recommends using a network cable no more than 100 meters long.

1.2 WLAN Button

The FRITZ!Box is equipped with a WLAN button on the rear panel of the housing.

The WLAN button can be used to activate and deactivate WLAN.

1.3 DECT Button

The FRITZ!Box is equipped with a DECT button on the rear panel of its housing. The DECT button has two functions:

1. Ring to search for misplaced handsets (paging call):

   If you press the DECT switch once briefly, the handset will ring.

2. Start the login procedure to register handsets:

   How to register a DECT handset is explained in the section “The DECT Function” from page 32.

1.4 Technical Specifications

Ports and Interfaces

- DSL/VDSL/telephone port
  - DSL/VDSL modem in accordance with the standard ITU G.992.1, ITU G.992.3 (ADSL2), ITU G.992.5 (ADSL2+), ITU G.994.1 (G.hs)
  - Telephone port for connecting to the analog network or ISDN
- Two a/b ports for connecting two extensions via RJ11 sockets
- One ISDN S_0 NT port
  - S_0 bus with support for ISDN telephony devices; the CIP services voice, telephony, audio 3.1 and fax G2/G3 are supported.
- DECT GAP base station
- Four LAN ports via RJ45 sockets (standard Ethernet, 10/100 base-T)
- One USB host controller (USB version 2.0)
- WLAN Access Point with support for wireless networks
  - IEEE 802.11a – 54 Mbit/s
  - IEEE 802.11b – 11 Mbit/s
  - IEEE 802.11g – 54 Mbit/s
  - IEEE 802.11n draft 2.0 – 300 Mbit/s

Router Function

- DSL/VDSL router
- DHCP server
- Firewall with IP masquerading/NAT

User Interface and Display

- Configuration and status messages via a web browser on a connected computer
- Twelve LEDs indicate the condition of the device

Physical Specifications

- Dimensions (WxDxH): approx. 210 x 155 x 25 mm
- Supply voltage: 230 V / 50 Hz
- Maximum power consumption: 16 W
- Average power consumption: 6 W
- Firmware can be updated
- Conform to CE standards

1.5 Declaration of CE Conformity

The manufacturer AVM GmbH
Alt-Moabit 95
D-10559 Berlin

herewith declares that the product

FRITZ!Box Fon WLAN 7570 vDSL
Type: ADSL/VDSL WLAN Router

complies with the following directives:

1999/5/EC	R&TTE Directive: Radio Equipment and Telecommunications Terminal Equipment
2004/108/EEC	EMC Directive: Electromagnetic Compatibility
72/23/EEC	Low Voltage Directive: Electrical equipment designed for use within certain voltage limits

The following norms were consulted to assess conformity:

- CTR 3/1998.06.17
- ETSI TS 101 388
- ITU-T G.992.1
- ITU-T G.992.5
- ITU-T G.994.1
- ETSI ETR 328
- EN 301 489-17 V1.2.1 (2002)
- EN 301 489-1 V1.5.1 (2004)
- EN 55024/9.98 + A1/10.01 + A2/01.03
- EN 300 328 V1.6.1 (11.2004)
- EN 301 893 V1.4.1 (07.2007)
- EN 301 406 V1.5.1 (2003)
- EN 301 489-6 V1.2.1 (2002)
- EN 60950-1:2006

CE ⓘ

The CE symbol confirms that this product conforms with the above mentioned norms and regulations.

Berlin, 14/08/2008 Peter Faxel, Technical Director

Indication of Countries
The radio technology of this device is designed for use in all countries of the European Union and in Switzerland, Norway and Iceland. In France only indoor operation is permitted.

1.6 Disposal

The symbols shown below mean that old appliances and electronic parts must be disposed of separate from household waste.

Symbols for labeling electronic devices

In accordance with European regulations and the Electrical and Electronic Equipment Act (ElektroG), the FRITZ!Box Fon WLAN 7570 vDSL, as well as all devices and electronic components contained in the FRITZ!Box Fon WLAN 7570 vDSL package may not be disposed with household waste. Please bring these to your local collection points for disposal.

2 More about WLAN
AVM and WLAN

WLAN (Wireless Local Area Network) is a radio technology that allows Ethernet networks and access to the Internet to be provided without cable connections. This allows multiple users to share one wireless Internet connection.

2.1 Standards

The WLAN standards IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n (on the basis of the preliminary draft 2.0 of the standard) and IEEE 802.11i were developed by the Institute of Electrical and Electronic Engineers (IEEE).

The standards IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n define the transmission rate within a wireless LAN. The IEEE 802.11i standard is a security standard.

Standards for the Throughput Rate

Data throughput

The FRITZ!Box supports your choice of the standards IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n. WLAN adapters based on one or more of the standards listed can be used for WLAN connections with the FRITZ!Box.

The standards are intended for different frequency bands.

Standard	Frequency Band	Gross Data Throughput up to	Net Data Throughput up to
802.11a	5 GHz	54 Mbit/s	25 Mbit/s
802.11b	2.4 GHz	11 Mbit/s	5 Mbit/s
802.11g	2.4 GHz	54 Mbit/s	25 Mbit/s
802.11n	2.4 / 5 GHz	300 Mbit/s	100 Mbit/s

The throughputs listed differentiate between gross and net transmission rates. The net speed describes the transmission rate of the user data.

Range

The range within a WLAN is highly dependent on the following factors:

- the WLAN adapter used
- the structural conditions
- the amount of radio traffic on the same frequency band. Other WLAN networks, microwave ovens or Bluetooth transmitters (mobile telephones) may be active.

IEEE 802.11a

Because this standard works exclusively in the seldom used 5-GHz range, it offers the opportunity to transmit data relatively free of interference from external influences. WLAN adapters that support 802.11a are much less common that devices that work in accordance with the 802.11b/g standard.

IEEE 802.11b

With a maximum throughput rate of 11 Mbit/s, this is the oldest standard for radio networks. Older WLAN adapters of the first generation can communicate with the FRITZ!Box using 802.11b. However, if the WLAN adapter supports newer standards such as 802.11g, the latest standard should be used.

IEEE 802.11g

This is currently the most common WLAN standard. It communicates with a maximum of 54 Mbit/s gross in the 2.4-GHz frequency range (ISM) and guarantees broad compatibility with many WLAN devices.

However, due to heavy use of the 2.4-GHz range, interference is more common than in the less-used 5-GHz range.

IEEE 802.11n

This standard allows for high throughput rates and ranges. The FRITZ!Box supports 802.11n in the 2.4-GHz frequency band, or, if desired, also in the 5-GHz frequency band. Modulation processes and antenna techniques like MIMO (Multiple Input, Multiple Output) use the entire frequency band available more effectively than the older standards.

The use of the 802.11n standard—and thus the availability of higher throughput rates—is possible only if the WLAN connection is secured using the WPA2 security mechanism (AES-CCMP).

Combining this standard with the 802.11g ensures compatibility with older WLAN adapters.

The Standard for Security

IEEE 802.11i

The WPA2 security mechanism is defined in the IEEE 802.11i standard. WPA2 is an extension of the familiar security mechanism WPA (Wi-Fi Protected Access).

The main feature of the extension of WPA to WPA2 is the AES-CCMP encryption process:

Mechanism	Encryption
WPA	TKIP (Temporary Key Integrity Protocol)
WPA2	TKIP AES-CCMP AES-CCM based on the extremely secure AES (Advanced Encryption Standard) procedure. CCM (Counter with CBC-MAC Protocol) defines how the AES procedure is applied to WLAN packets.

FRITZ!Box supports the AES encryption procedure as part of the WPA2 mechanism, and the TKIP encryption procedure as part of the WPA mechanism. This means that the FRITZ!Box can be used in combination with any WLAN adapters that also support WPA2 with AES or WPA with TKIP.

2.2 Security

Security is of utmost importance within radio networks.

Radio signals can also be received outside of office or residential spaces and abused for criminal purposes.

Therefore it is important that no unauthorized users can register in a WLAN to use its Internet access or shared network resources.

FRITZ!Box includes settings on various levels that contribute to the security of your WLAN and thus to the security of your computers.

Encryption

The most important security setting is encryption. FRITZ!Box supports the security mechanisms WEP (Wired Equivalent Privacy), WPA (Wi-Fi Protected Access) and WPA2 as follows:

- As part of the WEP mechanism a static key is determined to serve for the encryption of the user data.

  Enter the key in the WLAN security settings of the FRITZ!Box. All of the WLAN adapters in your wireless network must also use this key.

- The WPA and WPA2 mechanisms provide for authentication while the connection is being established. For this a WPA password must be defined.

  When WPA is selected, the TKIP encryption method is used to encrypt the user data. In WPA2 the AES-CCMP encryption method is used.

  The encryption method you configure here must also be supported by your WLAN adapter.

  The user data are encrypted using an automatically generated key. This key is regenerated at regular intervals.

  The WPA password used may be 8 to 63 characters in length. For increased security, however, the password should be at least 20 characters long. Use numerals, letters and special characters and combine capitals and lower-case letters.

Default Setting

In the FRITZ!Box a method combining WPA + WPA2 encryption with the TKIP/AES-CCMP encryption method is preconfigured. This setting allows you to use WLAN adapters that support WPA (TKIP) or WPA2 (AES-CCMP) or both methods.

It is advisable to change the preconfigured WLAN key as soon as possible. Changes to the settings can be configured on the FRITZ!Box user interface.

Recommendation

If your WLAN adapter supports an encryption method that is more secure than the one preconfigured in the FRITZ!Box, you should select the more secure encryption method in your FRITZ!Box.

To configure the best security settings possible with FRITZ!Box and your WLAN adapter, please note the following recommendations:

- If your WLAN adapter supports WPA2 in accordance with the 802.11i standard:
  - Enable WPA encryption.
  - Select the WPA mode “WPA2 (CCMP)” or “WPA+WPA2”.
  - Replace the WPA network key with a new, unique value.
- If your WLAN adapter supports the WPA mechanism, but not the WPA2 mechanism:
  - Enable WPA encryption.
  - Select the WPA mode “WPA (TKIP)” or “WPA+WPA2”.
  - Replace the WPA network key with a new, unique value.
- If your WLAN adapter supports neither the WPA nor the WPA2 mechanism:
  - Enable WEP encryption.
  - Replace the WLAN key with a new, unique value.

We strongly recommend the use of a WLAN adapter that supports WPA or WPA2 (for instance, the FRITZ!WLAN USB Stick N). WEP is out of date and data encrypted with WEP can be deciphered within minutes.

2.3 Frequency Ranges

WLAN uses the frequency range around 2.4 GHz in the ISM band or, alternatively, the frequency range at 5 GHz.

You can use both frequency ranges with the FRITZ!Box.

2.4-GHz Frequency Band

A WLAN in the 2.4-GHz frequency band works in the same band as Bluetooth, microwave devices and many cordless telephones. This means that interference may occur within WLANs operated in the vicinity of such devices. Generally the only adverse effects are to the transmission rate; aborted connections and data losses are rare.

In the 2.4-GHz frequency range the European regulation authorities have designated 13 channels for WLAN. One channel has a bandwidth of 20 MHz.

A channel can have a bandwidth of 20 MHz (throughput up to 130 Mbit/s) or 40 MHz (throughput of up to 300 Mbit/s).

Channels located directly next to each other may overlap and result in mutual interference. For instance, if several WLANs are operated close to each other in the 2.4-GHz frequency range with a bandwidth of 20 MHz, a distance of at least five channels should be left empty between each two channels used. This means that if channel 1 is selected for one WLAN, the channels 6 through 13 can be selected for a second WLAN. This maintains the minimum distance between channels.

WLAN Autochannel

With the WLAN Autochannel function, the FRITZ!Box automatically searches for the channel subject to the least interference. Should problems with interference persist despite this function, try to identify the source of interference and switch it off manually.

Additional tips on interference in the WLAN radio network are presented in the section “Ruling Out Interference Caused by Other Wireless Networks” from page 105.

5-GHz Frequency Band

The FRITZ!Box can operate in the 5-GHz frequency band as an alternative. This frequency range is used much less often than the most common 2.4-GHz frequency range.

In the 5-GHz frequency band, your FRITZ!Box occasionally may change channels unexpectedly due to DFS (Dynamic Frequency Selection) if a “higher privileged user” simultaneously claims the selected channel. This can happen especially when military or civilian radar is used in the immediate vicinity.

A prerequisite for use of the 5-GHz frequency band is that all WLAN adapters in the network support this frequency range in accordance with the IEEE 802.11a or IEEE 8002.11n standard.

2.4 GHz or 5 GHz

The FRITZ!Box works in the WLAN network either in the 2.4-GHz range or in the 5-GHz range, but not parallel in both frequency ranges at the same time.

Bandwidth

In both frequency ranges you can select between channel bandwidths of 20 MHZ or 40 MHz (exception: channel 140 in the 5-GHz frequency band). The FRITZ!Box initially attempts to select a channel with 40 MHz bandwidth (throughput up to 300 Mbit/s). If this is not possible due to interference or channels already being used by other WLANs in the vicinity, the FRITZ!Box automatically switches over to a channel with 20 MHz bandwidth. Greater bandwidth provides for higher data throughput:

Bandwidth (MHz)	Maximum Data Throughput (Mbit/s)
20	130
40	300

Increasing bandwidths also increases the probability of interference by wireless networks in the vicinity. Large bandwidths reduce the frequency range available to other wireless networks in the vicinity.

Allocation of the WLAN channels in the 2.4-GHz range:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

Allocation of the WLAN channels in the 5-GHz range:

Channel	Frequency (GHz)	Channel	Frequency (GHz)
36	5.180	108	5.540
40	5.200	112	5.560
44	5.220	116	5.580
48	5.240	120	5.600
52	5.260	124	5.620
56	5.280	128	5.640
60	5.300	132	5.660
64	5.320	136	5.680
100	5.500	140	5.700 (20 MHz bandwidth only)
104	5.520		

3 More about Network Settings
FRITZ!Box and Networks

The FRITZ!Box is delivered with preconfigured network settings. According to these settings, all computers connected with the FRITZ!Box are located in the same subnetwork.

You can change any of these preconfigured settings, but should only do so if you are well versed in networking technology.

- The Glossary (see) explains concepts and terminology having to do with IP networks.
- The sections “IP Address” on page 134, “DHCP Server” on page 136 and “Subnetwork” on page 138 explain when it may make sense to change the preconfigured network settings, what the effects of these changes are, and how to make the changes.

If you do not have much experience in setting up networks, please read this chapter in full.

Upon delivery, the network settings of the FRITZ!Box are preconfigured as follows:

Factory Settings	
All computers are located in the same IP network	enabled
IP address	192.168.178.1
Subnet mask	255.255.255.0
DHCP server	enabled

3.1 IP Address

The FRITZ!Box is delivered with an IP address preset.

Factory Settings	
All computers are located in the same IP network	enabled
IP address	**192.168.178.1**
Subnet mask	255.255.255.0
DHCP server	enabled

The IP address and the corresponding subnet mask automatically yield the following values:

Network address of the subnet	192.168.178.0
Entire IP address pool for the computers	192.168.178.2 - 192.168.178.253

You can change the preset IP address.

When Does It Make Sense to Change the IP Address?

Circumstances

You should change the IP address of the FRITZ!Box if the following apply to your network:

- You have an existing local IP network, one subnet with several computers.
- Fixed IP addresses are registered in the network settings of the computer, and you do not want to or are not permitted to change these addresses.
- You want to connect the FRITZ!Box to the subnet in order to make the FRITZ!Box features available to all of the computers in the subnet.

IP Address

What IP address must you assign for the FRITZ!Box and what else must be taken into consideration?

- The IP address must come from the address range of your existing subnet.

- The subnet mask must correspond with that of the connected subnet.
- When the DHCP server of the FRITZ!Box is enabled, the addresses 20 through 200 in the fourth group of numerals of the IP address are reserved for the DHCP server. If none of the computers in your network has an address from this pool, the DHCP server can remain switched on. If one of the computers has a fixed address assigned from this pool, you should switch off the DHCP server.
- If you can no longer open the FRITZ!Box user interface after entering the IP address, see the information in the section “Errors Opening the User Interface” from page 95.

Reserved IP Addresses

The following address range is reserved in FRITZ!Box for internal purposes.

192.168.180.1 - 192.168.180.254

IP addresses from this range may **not** be assigned to FRITZ!Box.

How Can the IP Address Be Changed?

1. Start a web browser on your computer.
2. Enter fritz.box in the address line of the browser.
3. Select the “Advanced Settings / System” menu in the “Settings” area.
4. Click “Expert Mode” in the “System” menu, enable the setting “Show expert settings” and confirm this setting by clicking “Apply”.
5. Open the “System / Network Settings” menu.
6. Click the “IP Addresses” button.
7. Make the changes on the “IP Settings” page and then click “Apply”.

3.2 DHCP Server

The FRITZ!Box is equipped with its own DHCP server. The DHCP server is enabled by default in the factory settings. Every time the operating system on a computer connected with FRITZ!Box is started, it is assigned an IP address by the DHCP server.

Only one DHCP server may be active within any network.

Factory Settings	
All computers are located in the same IP network	enabled
IP address	192.168.178.1
Subnet mask	255.255.255.0
DHCP server	**enabled**

The IP address, the corresponding subnet mask and the activated DHCP server automatically yield the following values:

Network address of the subnet	192.168.178.0
Entire IP address pool for the computers	192.168.178.2 - 192.168.178.253
Address pool of the DHCP server	192.168.178.20 - 200

In every subnet of the FRITZ!Box, the addresses 20 through 200 in the fourth group of numerals of the IP address are reserved for the DHCP server.

Assigning the IP addresses via the DHCP server ensures that all of the computers connected with the FRITZ!Box are located in a single subnet.

The computers can receive their IP addresses from the DHCP server only if the setting “Obtain an IP address automatically” is enabled in the their IP settings. For more information, see the section “IP Settings” from page 106.

Fixed IP Addresses when the DHCP Server Is Enabled

If you would like to give fixed IP addresses to individual computers connected with the FRITZ!Box, despite the fact that the DHCP server is enabled, then you must disable the option “Obtain an IP address automatically” in this computer’s network settings and enter the fixed IP address manually in the appropriate fields.

Which IP Addresses Can You Assign to the Computers?

- The IP addresses must be from the same subnet as FRITZ!Box.
- The IP addresses may not come from the address pool of the DHCP server.

If the factory settings are not changed, that means the following IP addresses are available:

192.168.178.2 - 192.168.178.19

192,168,178,201 - 192.168.178.253

Each IP address can be assigned only once.

Disabling the DHCP Server

You can switch off the DHCP server.

To make sure that all computers remain in the same subnet as the FRITZ!Box even when the DHCP server is disabled, you must enter the IP addresses manually in the computer’s network settings. First disable the option “Obtain an IP address automatically” and then enter the IP address manually in the appropriate field.

In the case of the preset IP address of the FRITZ!Box, the following IP addresses are available for assignment to the computers:

192.168.178.2 - 192.168.178.253

Each IP address can be assigned only once.

Changing the DHCP Server Settings

Proceed as follows to open the DHCP server settings:

1. Start a web browser on your computer.
2. Enter fritz.box in the address line of the browser.
3. Select the “Advanced Settings / System” menu in the “Settings” area.
4. Click “Expert Mode” in the “System” menu, enable the setting “Show expert settings” and confirm this setting by clicking “Apply”.
5. Open the “System / Network Settings” menu.
6. Click the “IP Addresses” button.

The “IP Settings” page is opened. Here you can make the settings for the DHCP server.

3.3 Subnetwork

By default the option “All computers are located in the same IP network” is enabled in the FRITZ!Box.

Factory Settings	
All computers are located in the same IP network	**enabled**
IP address	192.168.178.1
Subnet mask	255.255.255.0
DHCP server	enabled

If the factory settings were not changed, this setting has the following effect:

The DHCP server of the FRITZ!Box assigns all of the computers connected with the FRITZ!Box an IP address from the address pool of the DHCP server.

Address pool of the DHCP server	192.168.178.20 - 200

This means that all of the computers connected with the FRITZ!Box are located in the same subnet.

Disabling “All computers are located in the same IP network”

If you switch off the setting “All computers are located in the same IP network”, the interfaces of the FRITZ!Box will receive their own IP addresses.

Factory Settings

Upon delivery the interfaces of the FRITZ!Box are configured as follows:

Interface	IP Address	Subnet Mask	DHCP Server
LAN 1	192.168.178.1	255.255.255.0	enabled
LAN 2	like LAN 1	255.255.255.0	enabled
LAN 3	like LAN 1	255.255.255.0	enabled
LAN 4	like LAN 1	255.255.255.0	enabled
WLAN	192.168.182.1	255.255.255.0	enabled

Thus the following address pools are available to the DHCP server:

Interface	Address Pool of the DHCP Server at the Interface
LAN 1	192.168.178.20 - 200
LAN 2	192.168.178.20 - 200
LAN 3	192.168.178.20 - 200
LAN 4	192.168.178.20 - 200
WLAN	192.168.182.20 - 200

Computers connected with the FRITZ!Box via different interfaces are located in different subnets.

Interface	Network Address of the Subnet
LAN 1	192.168.178.0
LAN 2	like LAN 1
LAN 3	like LAN 1
LAN 4	like LAN 1
WLAN	192.168.182.0

Deactivating

Proceed as follows to disable the setting “All computers are located in the same IP network”:

1. Open your a web browser on your computer and enter fritz.box in the address line of the browser.
2. Select the “Advanced Settings / System” menu in the “Settings” area.
3. Click “Expert Mode” in the “System” menu, enable the setting “Show expert settings” and confirm this setting by clicking “Apply”.
4. Open the “System / Network Settings” menu.
5. Click the “IP Addresses” button.

The “IP Settings” page is opened. Here you can change the setting “All computers are located in the same IP network”.

4 More about Internet Telephony
Voice over IP (VoIP)

Internet telephony has already been in use for years, but today it allows even private customers the convenience familiar from conventional telephony, usually at significantly lower prices.

Internet telephony has also made it considerably more convenient to use applications like conference calls and answering machines in networks. Further advantages include global availability at a single telephone number, and the development of new standards for security and voice quality.

File Transfer

All kinds of data transmission in the Internet use the Internet Protocol (IP). IP is packet-oriented. This means that the data are broken down into data packets for transmission and IP takes care of the transport of the individual data packets through the Internet. Language is also transmitted in the Internet in this manner.

In opposition to this, fixed-line telephony transmits data in a line-oriented manner. In this case data are transmitted in a coherent data stream.

4.1 Telephony Scenarios

If you have configured both a fixed-line number and an Internet number in FRITZ!Box, you can make calls in all directions:

- from the fixed-line network into the fixed-line network
- from the Internet into the fixed-line network
- from the Internet into the Internet

and receive calls from all directions as well.

4.2 Bandwidth Management

The FRITZ!Box is equipped with integrated bandwidth management. This function ensures that the speech quality during telephone calls over the Internet is not reduced by surfing activity. To do this, the FRITZ!Box adjusts all uploads and downloads to the currently available bandwidth. Because the FRITZ!Box also places a higher priority on Internet telephony connections over Internet data connections, unwelcome interference is largely avoided. Just as for any other analog call, once Internet telephony transmission capacity has been reached, remote partners receive a busy signal.

5 Customer Service Guide
Help on All Important Service Topics

AVM is there to help should any questions or problems arise. Here you will find the important information you need, in the form of manuals, updates and support.

MS Service Pack

In many cases problems which arise during operation can be resolved by installing the current Microsoft Service Pack for your operating system.

The current service packs can be obtained free of charge from Microsoft at the address:

www.microsoft.com

5.1 Documentation

To take advantage of all commands and features of your FRITZ!Box Fon WLAN 7570 vDSL, consult the following documentation:

Help

In the FRITZ!Box user interface you can open the detailed Help by clicking the “Help” buttons.

Readme

The Readme file contains current information which was not yet available at the time the manual was completed. The Readme file is included on the FRITZ!Box CD.

Manual

The manual of the FRITZ!Box Fon WLAN 7570 vDSL is included in PDF format in the “Info” folder on the FRITZ!Box CD.

You can install the Adobe Acrobat reader to view PDF documents from the “Info” folder of the FRITZ!Box CD.

5.2 Information in the Internet

On its web site AVM presents comprehensive information on your AVM products as well as new product announcements and new product versions.

Frequently Asked Questions (FAQs)

We would like to make our products as easy to use as possible. If you still have problems, sometimes a little tip is all you need to resolve them. That is why we present you with a selection of frequently asked questions.

The FAQs can be viewed at the following address:

www.avm.de/en/service/FAQs

5.3 Updates and Software

AVM provides firmware updates and various software for the FRITZ!Box Fon WLAN 7570 vDSL for free downloading over the Internet.

Firmware

Use the “Firmware Update” Wizard on the FRITZ!Box user interface to perform an update of your firmware.

In the “Settings” area, open the “Wizards / Firmware Update” command to download the firmware from the Internet and perform the update with a single mouse click.

Programs

The “Software” menu in the “Settings” area shows all of the software for your FRITZ!Box available for downloading from the Internet.

The latest software is also available for download at the following address:

www.avm.de/en/download

FTP

Experienced users can also download updates from the AVM FTP server. Click the “FTP Server” link in the download area, or enter the following address:

ftp.avm.de

5.4 Support from the AVM Service Team

Should problems with your FRITZ!Box arise, we recommend taking the following steps:

1. If you have questions about starting operation of your FRITZ!Box, please consult the chapter “Connecting” from page 13.
2. Please see the information in the section “Product Details” on page 119.
3. If you have any problems, seek “first aid” by consulting the chapter “Troubleshooting” from page 95.

   This chapter also presents useful tips on problems with establishing connections.
4. The next step is to consult the FAQs in the Internet:

   www.avm.de/en/service/FAQs

   This site contains answers to questions our customers have frequently asked our Support team.
5. If you do not find the answer you need in the FAQs, AVM Support will assist you. The support desk can be reached by e-mail or by fax.

Please take advantage of the information sources described above before contacting AVM support.

Support by e-mail

You can send us an e-mail request at any time using the Service area of our website. The Service area can be reached at:

www.avm.de/en/service

From the Support area, select the product, your operating system, and the topic for which you need support. Click the “Mail Form” link to open the e-mail support form. Fill out the form and send it to AVM by clicking the “Send” button. Our Support team will respond by e-mail as quickly as possible.

Support by Fax

If necessary, you can reach AVM Support at the fax number:

+49 (0)30 / 39 97 62 66

The following information should be included in your fax to the Support team:

- Your name and address.
- An e-mail address or fax number at which you can be reached.
- the serial number of the FRITZ!Box

  The serial number is printed on the sticker attached to the base of the device. Support staff will always check this number to ensure that you are a registered user.
- Which operating system are you using (e.g., Windows Vista or Windows XP)?
- How is the FRITZ!Box connected to your computer, with a network cable or via WLAN?
- At what step of the installation or in which application does an error occur or an error message appear? What is the exact wording of the message?
- Which firmware does FRITZ!Box use? The firmware version is displayed on the “Overview” page of the FRITZ!Box user interface.

Once you have put together this information, please fax it to AVM Support. The Support team will assist you in resolving your problem.

6 Glossary

ADSL abbreviation for Asymmetric Digital Subscriber Line

Designates a fast kind of file transfer that works with standard copper cables and transports signals in both directions at different speeds (upstream at 640 Kbit/s and downstream at up to 9 Mbit/s).

ADSL2 abbreviation for Asymmetric Digital Subscriber Line 2

ADSL 2 (G.992.3) is a further development of the ADSL norm (G.992.1/G.992.2).

ADSL2 offers range much greater than did the first ADSL generation, and is significantly more robust than ADSL, as it can simply switch off interference from single carrier frequencies. This feature allows ADSL2 to prevent synchronization losses.

With a throughput rate of up to 12 Mbit/s downstream, ADSL2 offers considerably greater bandwidth than ADSL.

ADSL2 is completely downward compatible, meaning that terminal equipment compliant with ADSL can also be operated on ADSL2 lines, although the devices cannot exploit the advantages of ADSL2.

ADSL2+ abbreviation for extended bandwidth Asymmetric Digital Subscriber Line 2

ADSL2+ (G.992.5) is a further development of the ADSL norm (G.992.1/ G.992.2).

ADSL2+ offers a doubled frequency range used for downstream transmission, and thus double the maximum bandwidth achievable for downstream to 24 Mbit/s.

ADSL2+ is completely downward compatible, meaning that terminal equipment compliant with ADSL and ADSL2 can also be operated on ADSL2+ lines, although the devices cannot exploit the advantages of ADSL2+.

ADSL-Controller

An ADSL-Controller is an electronic hardware assambly that allows a computer to access an ADSL line. ADSL-Controllers are stationary equipment, included on internal ADSL cards (for the PCI bus) or in external ADSL modems (with USB or Ethernet ports).

Alias

Alias means *different*, *else* and *also known as*. An alias is often a short, catchy substitute for a long, complicated string of characters, for example, the actual name of the user J.Smith@my-internetprovider.com in place of the string 030123456@my-internetprovider.com. Here the name *J.Smith* functions as an alias for *030123456*.

context menu

The context menu is a menu that is normally not visible. The context menu opens only when you click a button, a graphic or a word with the right mouse button. Depending on where you clicked, the context menu contains only the most common menu commands for the given object.

If you are using an Apple computer, click the “Ctrl” while clicking.

default gateway

see gateway

DHCP

abbreviation for Dynamic Host Configuration Protocol

DHCP is a protocol for the dynamic negotiation of the operating parameters for the TCP/IP protocol (TCP is a transport protocol based on the Internet protocol). The computers of a local IP network (DHCP clients) access the DHCP server as part of their operating systems’ start procedure.

The central administration of the TCP/IP operation parameters makes it possible to avoid address conflicts caused by IP addresses accidentally assigned more than once.

DHCP server

The DHCP server assigns each client an IP address that is not yet been assigned at the present time. The DHCP server also informs the client of the IP addresses of the DNS server to be used and of the default gateway. In assigning the IP addresses the DHCP server selects from a prescribed pool of IP addresses.

DNS

abbreviation for Domain Name System

Domain Name Service takes care of determining the IP address for a given domain name. Domain Name Service is running on every computer. It accepts the domain name entered by a user and inquires about the corresponding IP address at a DNS server known to the service. If a DNS server cannot answer the inquiry itself, it can inquire about the IP address (DNS resolution) at other DNS servers.

If the Domain Name Service receives negative information from the DNS server (domain name not known), it can send inquiries to other DNS servers it knows or return a corresponding error message to the user. If it receives the desired IP address instead, the application can use the IP address to retrieve the destination desired by the user.

This hierarchical system of DNS servers is known as the Domain Name System. The addresses of the DNS servers at which the Domain Name Service is to inquire by default generally are handed over to the computer by the Internet Service Provider automatically whenever a connection to the Internet is established. In local networks addresses can also be assigned via DHCP. Otherwise they must be entered manually in the TCP/IP configuration of the PC by the user or the system administrator.

DSL modem

A DSL modem connects a computer to the Internet via the DSL line. In contrast to the analog modem, a connection via the DSL modem does not mean that the telephone line is busy.

DSL router

A combination of a DSL modem and a router is called a DSL router.

dynamic DNS

abbreviation for Dynamic Domain Name System

Dynamic DNS is a service which allows a computer always to be reached under the same domain name despite constantly changing IP addresses. This means that even private users have an economical way of placing their own Internet offers on their computer at home.

It works by transmitting the current IP address to a special DDNS server each time the IP address changes. Except for the few seconds between the cancellation of the old IP address and the notification of the new IP address, the computer can always be reached at the selected domain name.

dynamic IP address

A dynamic IP address is an IP address valid only for the duration of one Internet or network session.

Every computer participating in the Internet must have a uniquely assigned public IP address. Since only a limited number of such IP addresses is available, they must be used sparingly. That is why most of the Internet participants who dial in to the Internet receive a dynamic IP address. They are called dynamic because every participant receives a new public address that has not been assigned yet each time he or she dials in to the Internet.

By contrast, dynamic addresses are usually used in local IP networks because they are easy to handle, and because using them avoids incorrect IP address entries or unintentional double assignments. The DHCP service is responsible for assigning unique dynamic IP addresses.

FAQ

abbreviation for Frequently Asked Questions

FAQs are collections with answers to frequently asked questions on a certain subject area.

firewall

A firewall protects a computer or local network against attacks from the Internet.

Most firewalls work with packet filters, which merely check the IP addresses and port numbers of incoming and outgoing data packets and filter the packets according to prescribed rules.

Some firewalls also integrate additional concepts like IP masquerading and NAT to decouple data traffic by distinguishing strictly between the internal and external network.

Especially effective firewalls go even further, analyzing and evaluating the contents of the packets and filtering them according to prescribed rules. Such techniques are included in a Stateful Packet Inspection Firewall, for instance.

firmware The firmware is saved in programmable components within a device. Through the possibility of updating the firmware by computer at any time, manufacturers enjoy great flexibility in reacting to the demands of the operational environment, integrating new functions requested by customers, and eliminating errors discovered after production.

fixed IP address Fixed IP addresses are IP addresses which are permanently assigned to a computer or another device like a network printer.

Assigning fixed IP addresses makes sense in cases where a local network has a sufficiently large pool of IP addresses available, or when a computer is always supposed to be accessible at a certain address (such as a web server or an e-mail server).

FTP abbreviation for File Transfer Protocol

The File Transfer Protocol allows files to be exchanged between two computers operating in the Internet. Data exchange takes place via an FTP server and what is known as an FTP client. The more convenient FTP clients are available as stand-alone software or are components of some ISDN data transfer software; simple FTP clients are now included in many web browsers.

gateway Gateway is a general term designating an interface between two computer networks. Such a network interface can be realized using a router or a bridge, for instance.

If a computer wants to transfer data packets to a computer in another network, it must first transmit the packet to the gateway. To do this, the computer must know the address of the gateway.

If all packets that cannot be delivered in a local network always are to be transmitted to their given recipients via the same gateway, for this purpose the address of the gateway must be saved as the default gateway in the network configuration of the computer.

Such a default gateway for the computer is negotiated automatically by the operating system or the dialing software whenever an ISDN-Controller or DSL-Controller establishes a connection to the Internet. If a router is used for the shared Internet access in a local network, the IP address of the router must be entered as the default gateway in the TCP/IP configuration of each computer that wishes to use the Internet connection. If the TCP/IP configuration is performed by means of a DHCP server, there is no need to enter the gateway address manually.

IP abbreviation for Internet Protocol

The IP Internet Protocol is the most important basic protocol for the control of data exchange in local networks and in the Internet. The Internet protocol works without a connection; in other words, data packets are transmitted from the sender to the recipient without previous consultation. The addresses of the recipient and the sender in the data packets are given as IP addresses.

IP address abbreviation for Internet Protocol address

In IP-based networks, for instance in the Internet and local networks, all connected devices are addressed via their IP addresses. So that data packets are sure to be delivered to the right address, each IP address may be assigned only once within the Internet or a local IP network.

The IP address consists of four three-digit groups of numbers (for instance, 192.168.178.247). Each group of numbers can assume values between 000 and 255.

Every IP address contains two components: the network address and the host address. These two components can be read out of an IP address only if the subnet mask is also specified.

IP addresses can be public or private, and also fixed or assigned dynamically. See the corresponding entries in the glossary for more information.

IP addressing

Addressing is one of the main functions of the Internet Protocol (IP). Internet addresses can be written in decimal, octal or hexadecimal notation. The FRITZ!Box uses “dotted-decimal” notation: The four bytes of an address are represented by decimal numbers separated by dots. The total volume of Internet addresses, the address space, is separated into classes (A, B, C, D, and E). The full set of IP addresses, called the address space, is grouped into address classes designated as A, B, C, D and E. Only the first three of these five address classes are actually used. These classes can be described as follows:

Classes	Properties	Network Address, Decimal Value
Class A address	Few networks, many hubs	0-127
Class B address	Intermediate distribution of networks and hubs	128-191
Class C address	Many networks, few hubs	192-223

Properties of IP Address Classes

Every IP address consists of two parts: the network address and the host address. The sizes of the network address and the host address are variable, and determined by the first four bits (of the first byte) of the IP address.

IP mMasquerading

By means of IP masquerading a computer or LAN can be protected from unauthorized connection request from the Internet. Masquerading works by converting the IP addresses used in a network to one public IP address. From the outside it appears that all requests are sent from a single computer.

IP network

A network in which data exchange takes place on the basis of the Internet Protocol is called an IP network.

port

So that a single network connection on a connection can be used by multiple applications to exchange data with remote sites at the same time, a computer administers what are known as ports for the IP-based protocols TCP and UDP. Ports substantiate the point of access for the data packets delivered via the IP Internet protocol. While the IP address determines the destination computer quite generally, the port addresses the communication interface provided by an application for a certain communication procedure.

The Internet protocol allots 16 bits for the specification of the port number. Thus a total of 65,535 different port numbers can be specified. Ports up to port number 1,024 are reserved for special system applications and typical Internet applications. These include, for instance, the port numbers 21 for FTP (File Transfer Protocol), 25 for SMTP (Simple Mail Transfer Protocol), 53 for DNS (Domain Name Service) and 80 for HTTP (Hypertext Transfer Protocol).

Ports are primarily of interest to users for their role in protecting an Internet connection from external attacks. Most firewalls offer the possibility of preventing data traffic on certain ports. This means that certain port numbers can be blocked to prevent data from being delivered to system services. This is also a way of preventing any Trojans (malicious applications opening backdoors on a computer) that may have infected your computer from receiving data on ports it created as means of accessing your computer for potentially damaging activities. A firewall blocks most atypical port numbers not required for normal operation of an application and offers specialized users the opportunity to forward specified ports.

port forwarding

With port forwarding it is possible to specify ports that will allow all incoming or outgoing data packets to pass through a router or firewall.

If a computer from the local network offers server services, for instance, the configuration of a router using NAT or IP masquerading must forward the port used by the server

service for access to incoming data packets and thus keep it open permanently. The private IP address of the given computer must be saved as the destination address for all of the packets arriving at the port.

Typical server applications which require port forwarding are FTP and Web servers. To allow access to a computer via remote management software like Symantec's pcAnywhere or Microsoft's Remote Desktop, or even use of a file-sharing program like eDonkey, the required ports must be released for port forwarding. Port forwarding settings for the most important application cases are quite simple as long as the settings of the router or the firewall already contain rules with a corresponding preconfiguration.

private IP address

Private IP addresses are used for computers and other network devices within local IP networks.

Since many local IP networks are not connected to the Internet except via single computers or routers (gateway), certain address ranges are excluded from the publicly available IP addresses so that they are available for assignment in local IP networks. An IP address may only be assigned once within the local network. A private IP address may exist in any number of other local networks.

public IP address

A public IP address is an IP address valid in the Internet. Every computer or router participating in the Internet must have a uniquely assigned public IP address. This address is usually negotiated dynamically with the Internet Service Provider when a connection to the Internet is dialed. The Internet Service Provider assigns the negotiated IP address to the computer or router for the duration of an Internet session.

subnetwork

A local IP network can consist of one subnetwork or be divided into multiple subnetworks. The division into subnetworks is performed when the local IP network is configured. The subnetworks of a local IP network are also IP networks.

subnetmMask

The subnet mask indicates which part of an IP address is the network address and which the address of the computer. The network address defines what is called the subnet.

Example 1	
IP address:	192.168.178.247
Subnet mask:	255.255.255.0
The assignment of the first three groups of numerals in the subnet mask indicates that the first three groups of numerals in the IP address define the network. The following addresses result:	
Network address of the subnet:	192.168.178.0
Address of the computer in the subnet:	192.168.178.247
IP address pool in the subnet:	192.168.178.0 - 192.168.178.255 The IP addresses 192.168.178.0 and 192.168.178.255 are reserved. This means that the addresses from 192.168.178.1 to 192.168.178.254 are available for assignment to the computers.

Example 2	
IP address:	192.,168.178.247
Subnet mask:	255.255.0.0
The assignment of the first two groups of numerals in the subnet mask indicates that the first two groups of numerals in the IP address define the network. The following addresses result:	

Example 2	
Network address of the subnet:	192.168.0.0
Address of the computer in the subnet:	192,168,178,247
IP address pool in the subnet:	192.168.0.0 - 192,168,255,255 The IP addresses 192.168.0.0 and 192.168.255.255 are reserved. This means that the addresses from 192.168.0.1 to 192.168.255.254 are available for assignment to the computers.

TCP/IP abbreviation for Transmission Control Protocol / Internet Protocol

TCP/IP is the "language" of the Internet. TCP/IP is used to refer to a suite of protocols used for data communication over the Internet. TCP and IP are the network and transport protocols underlying most Internet services, including file transfer (FTP) and e-mail communication (SMTP). TCP/IP is available for practically all computer systems. TCP/IP thus offers the advantage of trouble-free communication between otherwise incompatible networks and systems.

TR-069 T-069 is an HTTP-based protocol for communication between CPE (Customer Premises Equipment) and an Auto Configuration Server (ACS) belonging to the Internet Service Provider. The TR-069 protocol is also known under the alternative name CPE WAN Management Protocol (CWMP). It offers the possibility of secure automatic configuration of the terminal device and thus, most importantly, facilitates simple initial configuration of the ADSL terminal equipment by the end customer.

The TR-069 protocol can be used for automatic configuration only if it is actively supported by the given terminal device. For this an Auto Configuration Client (ACC) must be integrated in the device. The specifications for automatic configuration of the ADSL terminal device are stored on the Auto Configuration Server by the given Internet Service Pro-

vider. The process of automatic configuration via TR-069 is initiated by the ADSL terminal device. First the user enters a security key and then the settings are retrieved from the Auto Configuration Server and implemented in the ADSL terminal device without any further interaction with the user. During this process all of the communication between the ADSL terminal device and the Auto Configuration Server takes place in encrypted form.

traffic shaping

Traffic shaping is a technology for the optimization of capacity loads in a communication connection. Especially for asymmetrical DSL connections, using traffic shaping can prevent that a download is delayed or blocked by high upload traffic.

Data transfer in the Internet is generally based on the TCP/IP protocol, which waits for the remote site to confirm reception after sending one or more data packets. Additional data packets are not sent until this confirmation of reception arrives. If no confirmation arrives over a longer period of time, the non-confirmed data packets are transmitted again. The dispatch of such a confirmation can be delayed, for instance, because the bandwidth for transfer (upload) is already being used by the data packets of other applications. But since the remote site does not signal the reception of the expected confirmation packets until after they have arrived, this could cause noticeable delays in rendering a requested web site or a drop in the throughput rate of a download. In the worst-case scenario, the remote site will abort transmission after several apparently unsuccessful attempts to transfer the data packets. Typical causes for such a blockade situation include sending an e-mail message or the use of a program for private data exchange (also known as file sharing or peer-to-peer software).

Through traffic shaping these delays are avoided by providing the dispatch of confirmation packets with bandwidth suitable for the given download activities. All of the packets to be sent are also assigned a priority suitable for their packet types.

update A more recent version of software or firmware is called an update. Updates are often free of charge, resolve minor programming errors, and sometimes also offer new functions.

upload This term designates the procedure of transmitting files from one's own computer to another computer in the Internet.

UPnP abbreviation for Universal Plug and Play (UPnP)

UPnP is an extension of the Microsoft Plug & Play standard that allows devices to network globally and to exchange services—without a central server or computer.

UPnP allows devices from all kinds of manufacturers (stereo systems, routers, printers, house controls) to be controlled via an IP-based network, with or without central control through a gateway. It is based on a number of standardized network protocols and data formats. Expressed simplistically, devices can communicate with each other using UPnP to exchange information.

Today the UPnP forum specifies the UPnP standard and certifies devices that are compliant with the standard.

VoIP abbreviation for Voice over IP, also known as Internet telephony

Voice over IP makes telephone calls possible via the Internet. The technology has already been in use for years, but today it allows even private customers the convenience familiar from conventional telephony, usually at significantly lower prices. VoIP has also made it considerably more convenient to use applications like conference calls and answering machines in networks. Added to this are global accessibility under a single telephone number and new VoIP features like the Buddy List known from chat rooms.

Internet telephony used to be possible only with a headset connected to the computers of the callers and their conversation partners. Today voice connections via the Internet, even to fixed-line and mobile networks, can be conducted conveniently using VoIP telephone systems that allow al-

ready existing analog telephones to be used even when the computer is switched off. Various Internet Service Providers and telephony carriers provide SIP fixed-line gateways for this purpose. Such a gateway is used to produce voice connections between the Internet and conventional telephone networks. In principle VoIP conversations are possible via every DSL line, but for convenient use with existing terminal equipment, and for conversations with the fixed-line and mobile networks, it is important that the DSL provider support what is known as the SIP standard. SIP is the current standard defined for VoIP by the IETF (Internet Engineering Task Force).

WLAN abbreviation for Wireless LAN, or Wireless Local Area Network

The term WLAN designates the industry standard for wireless local networks passed by the Institute of Electrical and Electronics Engineers (IEEE) in 1997 under the title IEEE 802.11.

By means of WLAN technology, individual computers or network devices like printers or DSL access points can be linked wirelessly to an existing cable-connected local network (LAN), or LANs can be converted completely to a wireless structure. A further useful purpose for WLAN technology is to link segments of existing cable-connected networks.

Although WLAN was actually developed only for short-range connections, by cascading WLAN access points or implementing transmission networks with high-power point-to-point radio transmission, even network segments located further from each other can be linked or network participants in relatively remote locations can be economically and easily integrated into an existing network.

WLAN access points often also serve as access points to the Internet in private or public institutions. Many airports, hotels and cafes, for instance, make WLAN hotspots available to their customers, either free or subject to a charge. Ultimately this has maneuvered WLAN into serious competition with mobile UMTS technology.

The application possibilities for wireless network communication also overlap with Bluetooth technology. For mobile devices with very low power consumption Bluetooth is the more useful solution, however, as Bluetooth uses considerably less power than wireless LAN. What is more, Bluetooth technology is more flexible and thus offers a greater bandwidth of potential applications.

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